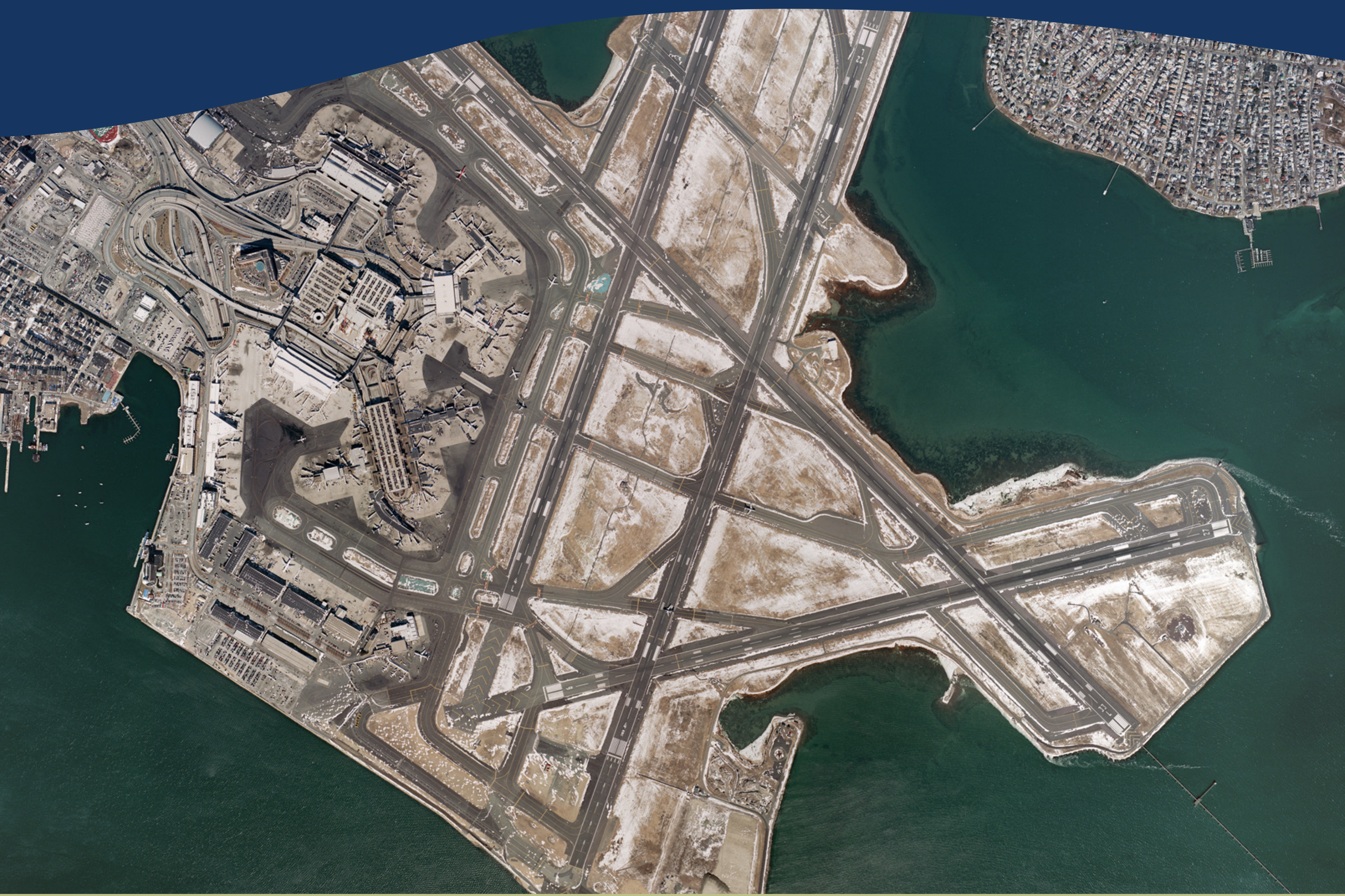




2006 EDR

Environmental Data Report



EOEA #3247
September 2007

SUBMITTED TO:
Executive Office of Energy and Environmental Affairs, MEPA Office

SUBMITTED BY:
Massachusetts Port Authority
Economic Planning & Development

PREPARED BY:
VHB Vanasse Hangen Brustlin, Inc.

IN ASSOCIATION WITH:
Harris Miller Miller & Hanson, Inc.
KB Environmental Sciences, Inc.
Simat, Helliesen & Eichner, Inc.

Boston-Logan International Airport

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Introduction/ Executive Summary

Introduction

Boston-Logan International Airport ("Logan Airport" or "Airport"), owned and operated by the Massachusetts Port Authority (Massport), is New England's primary international and domestic airport. This *Boston-Logan International Airport 2006 Environmental Data Report (2006 EDR)* is part of a series of environmental review documents submitted pursuant to the Massachusetts Environmental Policy Act (MEPA) to report on the cumulative effects of Logan Airport's operations and activities. Massport prepares EDRs annually; they provide a snapshot of environmental conditions for the reporting year compared to the previous year. Every five years Massport prepares an Environmental Status and Planning Report (ESPR) which provides an historical and prospective view of Logan Airport.

The scope of this *2006 EDR* is set out in the Secretary of the Executive Office of Environmental Affairs' (EOEA) Certificate dated February 15, 2007, which is included in *Appendix A, MEPA Certificate and Responses*. This *2006 EDR* updates and compares the data presented in the *2005 EDR*, and presents activity levels (including aircraft operations and passenger activity) and environmental conditions at Logan Airport for calendar year 2006. To enhance the usefulness of the *2006 EDR* as a reference document for reviewers, this *2006 EDR* also presents historic data on the environmental conditions at Logan Airport dating back to 1990. An update on the projects underway at Logan Airport in 2006 and the mitigation measures currently being implemented also are provided. An overview of Massport's sustainability initiatives are described in this chapter.

EOEA # 3247

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Logan Airport Environmental Review Process

This *2006 EDR* is part of an ongoing state-level environmental review process that assesses Logan Airport's cumulative environmental impacts. The process provides a context against which individual projects meeting state and federal environmental thresholds are evaluated on a project-specific basis. The Airport-wide and project-specific environmental review processes are described below.

Logan Airport-Wide Review

In 1979, the Secretary of the then-EOEA (now the Executive Office of Energy and Enviromental Affairs [EOEEA]) issued a Certificate requiring Massport to define, evaluate, and disclose, every three years, the impact of long-term growth at the Airport through a Generic Environmental Impact Report (GEIR). The Certificate also required interim Annual Updates to provide data on conditions for the years between the GEIRs. The GEIR evolved into an effective planning tool for Massport and provided projections of environmental conditions where the cumulative effects of individual projects could be understood.

EOEA eliminated GEIRs following the 1998 revisions to its MEPA Regulations. However, the Secretary's Certificate on the *1997 Annual Update*[1] proposed a revised environmental review process for Logan Airport. As a result, Massport evaluates the cumulative impacts associated with Logan Airport activities through preparation of an ESPR every five years and provides data updates annually through the EDRs. The next EDR will be filed in 2008 and will report on the 2007 calendar year. The next ESPR will be filed in 2010, and will report on the 2009 calendar year.

1 Certificate of the Secretary of the Executive Office of Environmental Affairs on the *Logan Airport 1997 Annual Update*, issued on October 16, 1998.

Project-Specific Review

While this Airport-wide review provides the broad planning context for proposed projects and future planning concepts, Airport projects are also subject to a project-specific, public environmental review process when state environmental review thresholds are met. When necessary, Massport and Airport tenants submit Environmental Notification Forms and Environmental Impact Reports pursuant to MEPA.

Similarly, where National Environmental Policy Act (NEPA) environmental review thresholds are triggered, projects are reviewed under the Federal Aviation Administration (FAA) environmental review process.

Overview of Logan Airport

Logan Airport is New England's primary domestic and international airport. Logan Airport is an origin-destination airport, not a connecting hub for major airlines. The Airport plays a key role in the metropolitan Boston and New England passenger and freight transportation networks and is a significant contributor to the regional economy. In 2004, Logan Airport employed a total of approximately 12,000 people (a full time equivalency of 10,879 jobs) and activities associated with the Airport contributed an average of $19 million a day into the local economy.[2] According to FAA, in 2006 Logan Airport was the 16th busiest commercial aviation facility in the United States (U.S.) ranked by aircraft operations.[3]

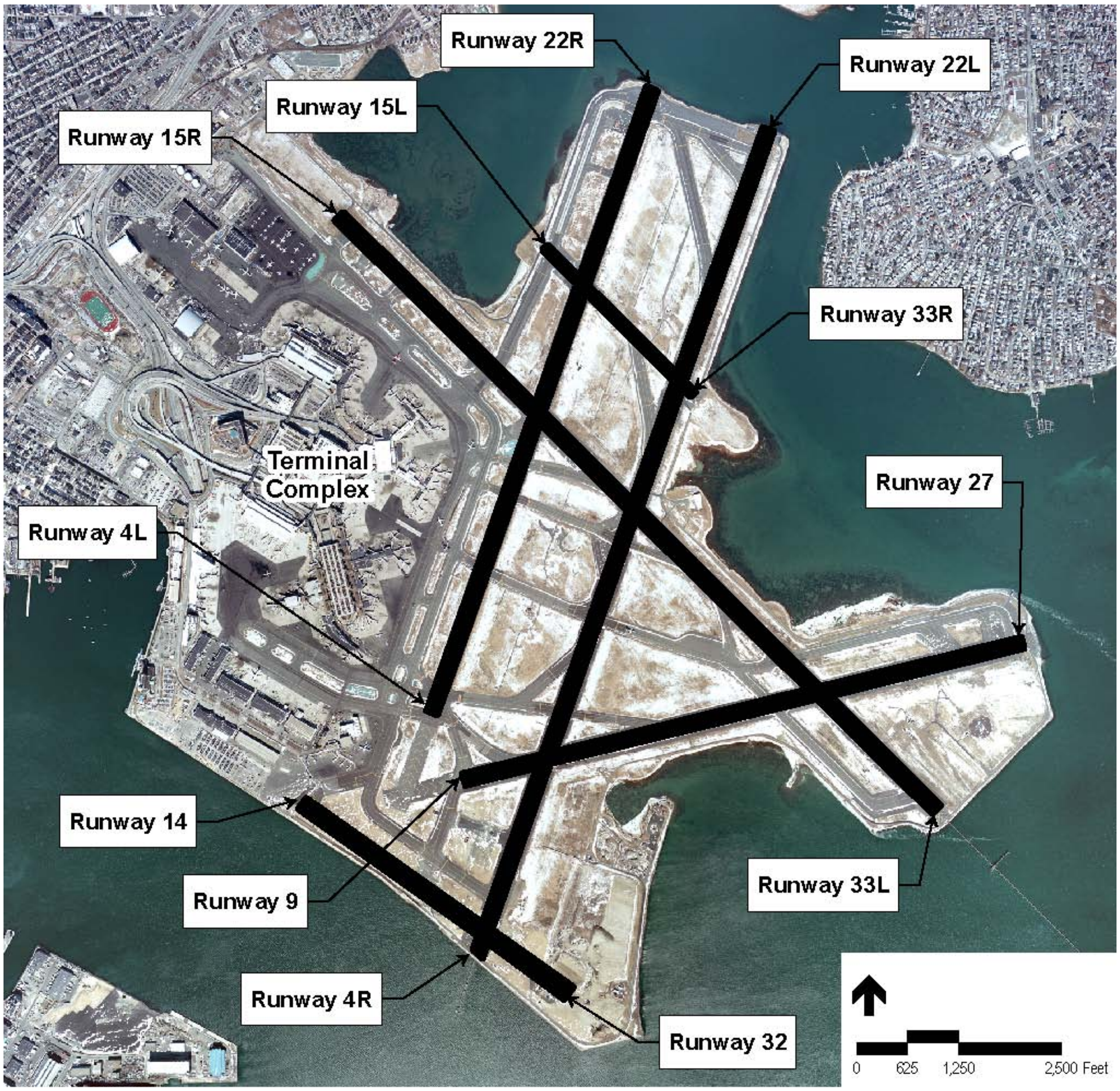
The Airport boundary encompasses approximately 2,400 acres in East Boston and Winthrop, including 700 acres of Boston Harbor. Logan Airport, shown in Figures 1-1 and 1-2, is one of the most land-constrained airports in the nation and is surrounded on three sides by Boston Harbor.

Logan Airport is close to downtown Boston and is accessible via public transit and a well-connected roadway system. The airfield comprises six runways, 14 miles of taxiway, and approximately 240 acres of concrete and asphalt apron. The sixth runway, the 5,000 foot unidirectional Runway 14-32, became operational on November 23, 2006. Logan Airport has four passenger terminals (Terminal A, B, C and E), each with its own ticketing, baggage claim, and ground transportation facilities.

Massport, Logan Airport's owner and operator, continues to evaluate and implement enhancements to Logan Airport's security, operational efficiency, and accessibility to and from the Boston metropolitan area, while carefully monitoring the environmental effects of Logan Airport operations.

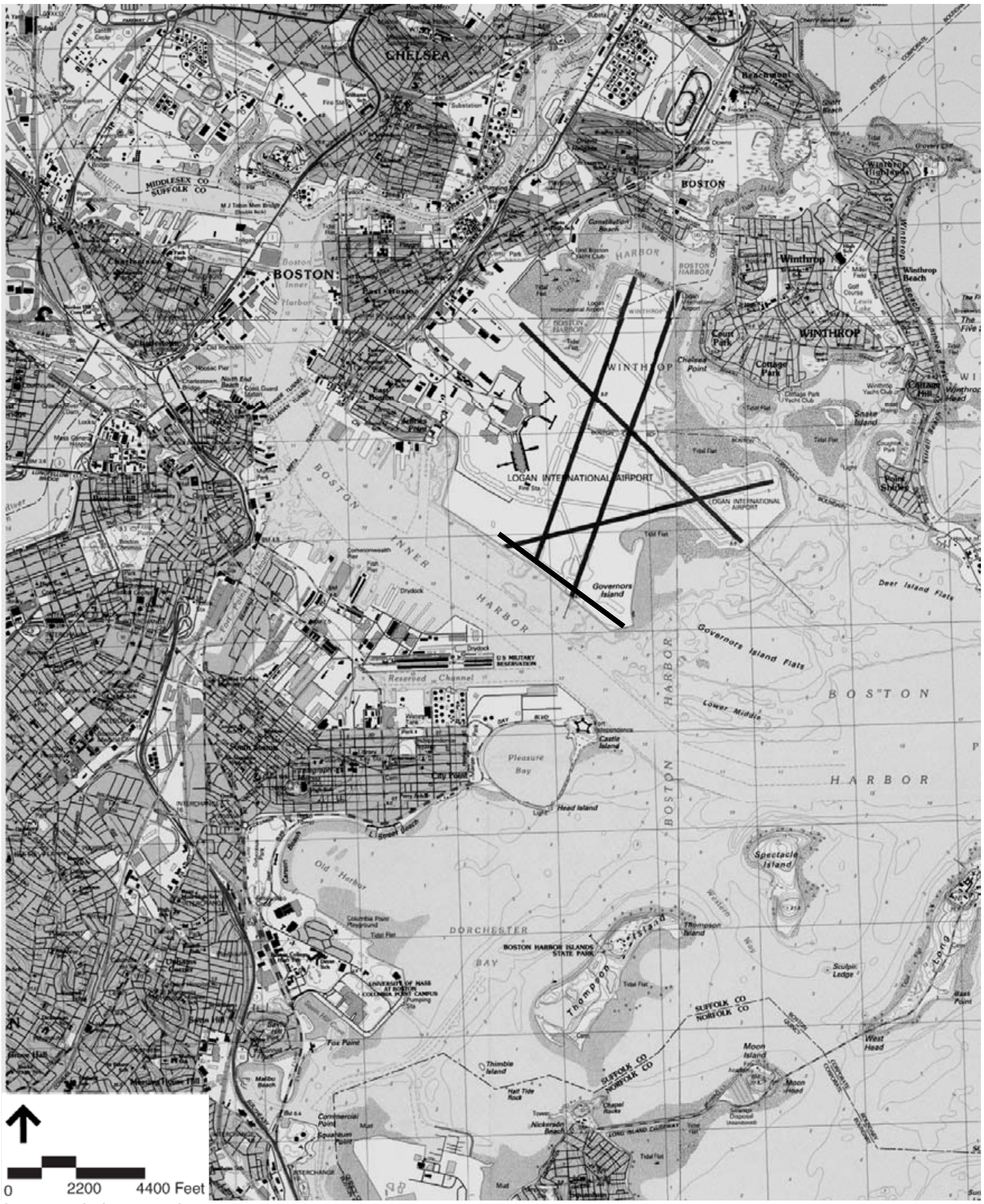
2 *Economic Impact Report 2006*, Massachusetts Port Authority, 2006.
3 *Top 50 Busiest U.S. Airports for 2006*, FAA (January 8, 2007) www.faa.gov/news/updates/busiest_airports/index.cfm (Accessed July 11,2007).

Figure 1-1 Aerial View of Logan Airport



Note: Aerial photo taken February, 2006. Runway 14-32 construction completed in November, 2006.

Figure 1-2 Logan Airport



Source: U.S. Geological Services.

2006 Highlights and Accomplishments

This section provides a brief overview of key events and accomplishments at Logan Airport in 2006. Additional information concerning all aspects of Airport activities is provided in subsequent chapters.

Activity Levels

- In 2006, the total number of air passengers reached 27.7 million, up from 27.1 million in 2005. Growth in the total number of air passengers at Logan Airport slowed from the 2005 rate (2.4 percent compared to 3.6 percent).
- The total number of aircraft operations declined from 409,066 in 2005 to 406,119, a decrease of 0.7 percent.
- The total number of aircraft operations decreased even though the total number of air passengers increased because airlines increased their load factors (the number of passengers per aircraft operation).
- In 2006, JetBlue increased its Logan Airport service by 16,000 operations and overtook United Airlines and Cape Air to become the fourth largest carrier at Logan Airport by operations after American Airlines, Delta Air Lines, and US Airways.
- Air cargo volumes continued to decline from 728 million pounds in 2005 to 679 million pounds in 2006 with the largest volume decrease in the express/small packages.
- In 2006, the U.S. airline industry was the strongest it has been since the beginning of the decade. Unlike 2004 and 2005, where improvements were made largely by controlling costs, the 2006 performance was revenue-driven, indicating an upturn in demand.

Planning

The following projects were completed in 2006:

- The new Terminal A, which opened on March 16, 2005, achieved Leadership in Energy and Environmental Design (LEED™) certification in June 2006. It is the first airport terminal in the U.S. to earn this ranking.
- The Silver Line is the most recent addition to the metropolitan area transit system and is Boston's first Bus Rapid Transit (BRT) line. Initial Silver Line service to Logan Airport began in December, 2004. In November, 2006 Silver Line service was enhanced with the addition of the Massachusetts Bay Transportation Authority's (MBTA) Charlie Card automatic fare collection kiosks in all Logan Airport terminals. Charlie Card kiosks are found in a total of seven locations at the Airport. This MBTA/Massport joint venture fulfilled a long-standing goal to provide MBTA subway/rapid transit ticketing in the Logan Airport terminals.
- Construction of the North Service Road (SR-2) Roadway Buffer was completed in 2006. The buffer consists of a sidewalk linking the Blue Line Airport Station to Logan Airport Terminals, and a landscaped area adjacent to the sidewalk.
- Construction of Phase 1 of the Southwest Service Area (SWSA) buffer began in 2005 and was completed in the fall of 2006. Phase 1 consists of landscaping and lighting improvements along Maverick Street.

- The Navy Fuel Pier Edge Buffer was completed in December 2006. The Navy Fuel Pier Edge Buffer provides a landscaped buffer between the East Boston Community and Logan Airport. Its design included bank stabilization, landscaping improvements such as plantings, fencing, rustic boulder seating, and a walkway.

Regional Transportation Context

- In addition to Logan Airport, which is the primary domestic and international airport, New England's other primary commercial service airports include the following ten regional commercial service airports: T.F. Green Airport, RI; Manchester-Boston Regional Airport, NH; Bradley International Airport, CT; Burlington Airport, VT; Bangor Airport, ME; Portland International Jetport, ME; Pease International Tradeport, NH; Worcester Regional Airport, MA; Hanscom Field, MA; and Tweed-New Haven Airport, CT.
- Overall, the number of air passengers utilizing New England's primary commercial service airports in 2006 declined marginally, from 48.0 million to 47.9 million. When measured by the number of aircraft operations, however, activity levels fell by 4.4 percent, from 1.4 million operations to 1.3 million operations. This reflects substantial changes in the commercial aviation sector and the continued decline of general aviation (GA) noted in the *2005 EDR*.
- Major airlines reduced capacity at the regional airports in 2006 as they reconfigured their operations in an effort to consolidate gains made in bankruptcy and near-bankruptcy restructuring. Passenger declines were generally consistent with capacity reductions.
- The average aircraft size of scheduled flights to the regional airports declined in 2006 as airlines substituted regional jet service for mainline jets on certain routes.
- GA operations at New England regional airports declined by 4.2 percent from 2005 levels. Declines in GA activity in New England continue to outpace declines in the rest of the country. According to the FAA, GA activity declined by 1.3 percent nationally in 2006, largely due to rising fuel costs.

Ground Transportation

- Ground transportation activity levels increased across the board from 2005 to 2006 as a result of a 2.4 percent increase in the number of air passengers, as described in *Chapter 2, Activity Levels.*
- A portion of I-90 connecting the City of Boston and areas to the south and west of Boston to Logan Airport was closed from July 2006 until early 2007, which is believed to have reduced traffic flows to and from the Airport.
- Ridership on the MBTA, Logan Express, water transportation, scheduled and unscheduled HOV Services, and taxis increased in 2006. This is due in part to the completion of roadway and other construction projects at the Airport, and to the closure of the I-90 connector to the Airport for much of 2006.
- Installation of the MBTA's automatic fare collection Charlie Card machines in all Logan Airport Terminals was completed in November 2006.
- In 2006, additional early morning transportation between New Hampshire and Logan Airport began, with Massport-subsidized service provided by the C & J Bus Company.
- The number of on-Airport parkers decreased by 8.4 percent in 2006.

Noise Abatement

- The overall number of people exposed to Day-Night Sound Level (DNL) values greater than 65 decibels (dB) decreased in 2006 compared to 2005. An estimated 5,583 people were exposed to DNL levels greater than 65 dB in 2006, compared to 6,477 in 2005, and 9,438 in 2004. For the second year in a row, fewer than 7,000 people experienced levels of 65 dB DNL and above.
- The 2006 Cumulative Noise Index (CNI) of 152.6 Effective Perceived Noise Level (EPNdB) remained well below the cap of 156.5 EPNdB. The CNI decreased compared to 2005 primarily because of decreased use of recertificated aircraft by cargo operators.
- Massport provided sound insulation for 857 residential dwelling units in 2006. This is the largest number of units to receive sound insulation in the vicinity of the Airport in any one year since the beginning of the program. Since the program's inception, Massport has sound insulated a total of 9,943 dwelling units. The majority of the units insulated in 2006 were in Chelsea.

Air Quality/Emissions Reduction

- The emissions inventory results are driven largely by improvements to the FAA Emissions and Dispersion Modeling System (EDMS), v5.0.1. These include the addition of aircraft main engine startup VOC emissions; adjustments to how aircraft performance profiles are modeled, which changed aircraft times-in-mode and thus emissions of all pollutants; an advanced method to calculate aircraft $PM_{10}/PM_{2.5}$ emissions; and updated ground support equipment (GSE) emission factors using NONROAD2005. The in-place air quality initiatives at Logan Airport and other ongoing efforts by Massport to minimize emissions also played a role, as did changes to aircraft taxi time, fleet mix, and number of operations.
- Largely because of these changes to EDMS, total emissions of VOCs appear to have increased by approximately 34 percent to 1,724 kilograms per day (kg/day) compared to 2005 levels. Using the EDMS available in 2005 (v4.5) total emissions of VOCs would have decreased by approximately nine percent to 1,168 kg/day due to a combination of changes in aircraft fleet mix, low GSE emission factors, and reduction in deicing activities. This information was included to show that the increase in VOCs (the only pollutant to increase in 2006) was due entirely to the updated EDMS model and not the result of changes in airport operations.
- Total emissions of NO_x were 4,151 kg/day or 1 percent lower than 2005 levels.
- Total emissions of CO were 8,144 kg/day or 15 percent lower than 2005 levels.
- Total emissions of $PM_{10}/PM_{2.5}$ were approximately 78 kg/day or 7 percent lower than 2005 levels.
- In 2006, NO_x emissions at Logan Airport were approximately 677 tons per year (tpy) lower than the 1999 threshold level established by Massport's Air Quality Initiative. This represents a 28 percent decrease since 1999.
- There was a continuing trend of decreasing NO_2 concentrations at both the Massport and Massachusetts Department of Environmental Protection (MDEP) monitoring sites located in the general vicinity of Logan Airport. In addition, in 2006 the annual NO_2 concentrations at all monitoring locations were well below the NO_2 air quality standards.

Water Quality/Environmental Compliance and Management

- Of the 92 hazardous material spills in 2006, 11 (12 percent) were considered reportable (i.e., over 10 gallons) under the applicable environmental regulations. Jet fuel spills accounted for 65 (71 percent) of the total spills, with nine of the jet fuel spills exceeding 10 gallons. The remaining 27 spills (29 percent) involved gasoline, hydraulic oil, diesel fuel, and other substances, including two reportable spills.
- In 2006, only four of 332 outfall samples exceeded the regulatory limits. The West Outfall and the Maverick Street Outfall each had one sample which exceeded the 15 milligrams per liter (mg/L) National Pollutant Discharge Elimination System (NPDES) limit for oil and grease. The North Outfall had two samples which exceeded the 0.3 milliliters per liter (ml/L) daily maximum limit for settable solids. This is an improvement compared to 2005, when eight samples exceeded the regulatory limits.
- In accordance with the Massachusetts Contingency Plan (MCP), Massport continues to assess, remediate, and bring to regulatory closure areas of subsurface contamination. In 2006, two of its five MCP sites were closed out, and Massport was working towards achieving regulatory closure of the three remaining MCP sites.

Sustainability at Logan Airport

Sustainability is defined as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs."[4] In this capacity, Massport has a commitment to implementing environmentally sustainable practices airport-wide, and continues to make progress on a range of initiatives.

Sustainability Goals

Logan Airport is a complex of interconnected buildings, transportation facilities, utility infrastructure, natural environments, and management systems. The long-range planning, ongoing development, and day-to-day operations can present opportunities to adopt sustainable practices that mirror Massport's environmental goals and demonstrate its leadership within New England and the aviation industry.

In October 2000, the Massport Board approved an Authority-wide Environmental Management Policy, which articulates Massport's commitment to protect the environment and to implement sustainable design principles.[5]

> *"Massachusetts Port Authority (Massport) is committed to operate all of its facilities in an environmentally sound and responsible manner.*
>
> *Massport will strive to minimize the impact of its operations on the environment through the continuous improvement of its environmental performance and the implementation of pollution prevention measures, both to the extent feasible and practicable in a manner that is consistent with Massport's overall mission and goals."*

In October 2004, the Massport Sustainability Team produced the *Massachusetts Port Authority Sustainability Plan* (Sustainability Plan). The Sustainability Plan presents Massport's long-term and short-term goals in relation to sustainability. It also identifies the actions necessary to achieve the goals, the staff members responsible for each sustainability goal, and the timeline for achieving the goals. The Environmental Management Policy is

4 United Nations. 1987. "Report of the World Commission on Environment and Development." General Assembly Resolution 42/187, 11 December 1987.
5 The Environmental Management Policy is on Massport's website at www.massport.com/business/envir_polic.html.

incorporated in the Sustainability Plan as Massport's long-term sustainability goal or vision. The short-term goals set out in the Sustainability Plan are described below.

Massport-wide sustainability goals are:

- Develop a policy that states that new development projects obtain LEED™ certification and include LEED™ Certified professionals on the design team.
- Establish and implement an Alternative Fuel Vehicle Policy (AFV) Policy that requires key personnel to review and consider AFVs when there is a request for a new or replacement vehicle and to select AFVs unless there is a compelling reason not to.
- Increase construction waste recycling and reuse.
- Implement a process to consider environmental impacts when making purchases.

Additional sustainability goals relating specifically to Logan Airport are:

- Establish a recycling program in Airport terminals.
- Retrofit or purchase heavy-duty equipment with diesel oxidation catalysts (DOCs) or particulate filters.

Sustainability is incorporated into many aspects of Massport's activities: Planning and Design; Construction; Operations, Maintenance and Management; and Monitoring of Environmental Performance. Some of the sustainability initiatives undertaken by Massport in these categories are described below.

Planning and Design

In spring 2006, Delta Air Lines and Massport submitted an application for LEED™ certification for the new Terminal A. LEED™ certification was awarded in June 2006, making Terminal A the first airport terminal in the U.S. to be awarded LEED™ certification. Obtaining LEED™ certification for Terminal A is consistent with Massport's short-term sustainability goals set out in the Sustainability Plan.

Sustainable Construction

Massport is committed to sustainable practices to help reduce impacts associated with construction. For example, Massport requires contractors to adhere to construction guidelines relating to demolition waste recycling, soil reuse, and air emissions from construction equipment.

Sustainable Operations and Maintenance

Massport has several programs in place that contribute to the environmentally sustainable operation and maintenance of Logan Airport and its facilities. Massport also encourages its tenants to do the same. These programs include:

- An alternative fuel vehicle program (refer to *Chapter 7, Air Quality/Emissions Reduction* for details on this program).
- Equiping aircraft gates with 400 Hz power and pre-conditioned air (PCA) that reduces the emission of air pollutants.

- A recycling program in Airport terminals and for construction and demolition debris. Massport implemented a terminal recycling program starting with the new Terminal A in 2005, Terminal C in 2006 and Terminals B and E in 2007. The program consists of post-security collection of mixed paper (newspaper, cardboard and magazines) and plastics, aluminum, and glass. Massport's administrative building at the Logan Office Center also participates in this program. In addition, Massport's construction contracts include a requirement for recycling of demolition debris and other materials.
- Reduced use of toxic materials and substitution with non-toxic alternatives.
- Promoting high occupancy vehicle ridership by employees and passengers (refer to *Chapter 5, Ground Transportation* for details).

Monitoring Environmental Performance

Massport has in place, or is in the process of developing, the following environmental monitoring and audit programs:

- An environmental Audit Program to track and promote consistent compliance by Massport facility managers and tenants with the many regulatory requirements relating to air quality, water quality, fueling practices, solid waste and hazardous waste, among others.
- In 2006, Massport continued its voluntary involvement with the Clean State Initiative and the State Sustainability Program, established under Executive Orders 350 and 438, respectively. Massport worked to identify, evaluate, and correct matters of environmental noncompliance. There are currently two outstanding environmental matters under the Clean State Initiative that Massport is working to resolve. The first relates to replumbing of stormwater/sanitary piping in both the Central and Terminal B garages. Work in the Central Garage was completed in 2007. Massport anticipates that work in the Terminal B garage will be completed in 2009. The second matter relates to a MCP site that is impacted by the CA/T Project. Massport expects to remediate and close out the MCP site in 2007.
- On July 23, 2002 the Governor signed Executive Order 438, establishing the State's Sustainability Program. That Order requires agencies to create written Sustainability Plans for managing ongoing environmental impacts, reaffirms the Governor's support of Executive Order 350. Massport continues to work with facility representatives and tenants to identify pollution prevention, recycling, and reuse opportunities. Massport remains a committed advocate of and participant in the State Sustainability Program, continuously striving to meet the EOEEA's goals and milestones.
- In 2006, Massport began developing an Environmental Management System (EMS) for Logan Airport, specifically for facilities where fleet and field maintenance activities are conducted. ISO 14001 certification was obtained for the maintenance facility in December 2006.

Organization of the *2006 EDR*

The remainder of this *2006 EDR* is organized as follows:

- ***Chapter 2, Activity Levels***, presents aviation activity statistics for Logan Airport in 2006 and compares activity levels to the prior year. The specific activity measures discussed include air passengers, aircraft operations, fleet mix, and cargo/mail volumes.
- ***Chapter 3, Airport Planning***, provides an overview of planning, construction, and permitting activities that occurred at Logan Airport in 2006. It also describes known future planning, construction, and permitting activities and initiatives.
- ***Chapter 4, Regional Transportation Context***, describes activity levels at New England's regional airports in 2006 and updates recent planning activities.
- ***Chapter 5, Ground Transportation***, reports on transit ridership, roadways, traffic volumes, and parking for 2006.
- ***Chapter 6, Noise Abatement***, updates the status of the noise environment at Logan Airport in 2006, and describes Massport's efforts to reduce noise levels.
- ***Chapter 7, Air Quality/Emissions Reduction***, provides an overview of airport-related air quality issues in 2006 and efforts to reduce emissions.
- ***Chapter 8, Water Quality/Environmental Compliance and Management***, describes Massport's ongoing environmental management activities including NPDES compliance, stormwater, fuel spills, activities under the Massachusetts Contingency Plan, and tank management.
- ***Chapter 9, Project Mitigation Tracking***, reports on Massport's progress in meeting its MEPA Section 61 mitigation commitments for specific Airport projects.

Supporting appendices include the following:

- **MEPA Appendices**: The MEPA Secretary's Certificate on the *2005 EDR*, comment letters received on the *2005 EDR* and responses to those comments, Secretary's Certificates on the annual reports issued for reporting years 1995 through 2004, a list of reviewers to which the *2006 EDR* was distributed, and a proposed scope for the *2007 EDR*.
- **Technical Appendices**: These include detailed analytical data and methodological documentation for the various environmental analyses presented in and conducted for this *2006 EDR*.

2
Activity Levels

Introduction

This chapter reports on annual aviation activity for Logan Airport in 2006, including air passengers, aircraft operations, fleet mix, and cargo/mail volumes. The 2006 levels are compared to 2005 levels; a trends analysis is conducted every five years in the Logan Airport Environmental Status and Planning Reports.

Key Findings

Highlights for 2006 are:

- In 2006, the total number of air passengers reached 27.7 million, up from 27.1 million in 2005. Growth in the total number of air passengers at Logan Airport slowed from the 2005 rate (2.4 percent compared to 3.6 percent).
- The total number of aircraft operations declined from 409,066 in 2005 to 406,119, a decrease of 0.7 percent.
- The total number of aircraft operations decreased even though the total number of air passengers increased because airlines increased their load factors (the number of passengers per aircraft operation).
- In 2006, JetBlue increased its Logan Airport service by 16,000 operations and overtook United Airlines and Cape Air to become the fourth largest carrier at Logan Airport by operations after American Airlines, Delta Air Lines, and US Airways.
- Air cargo volumes continued to decline from 728 million pounds in 2005 to 679 million pounds in 2006 with the largest volume decrease in the express/small packages.
- In 2006, the United States (U.S.) airline industry was the strongest it has been since the beginning of the decade. Unlike 2004 and 2005, where improvements were made largely by controlling costs, the 2006 performance was revenue-driven, indicating an upturn in demand.

Air Passenger Trends

Passenger levels in the U.S. as a whole initially recovered more rapidly from September 2001 levels than passenger activity levels at Logan Airport. However, air passenger levels at Logan Airport have recently been growing faster than the nation as a whole. The total number of passengers using Logan Airport in 2006

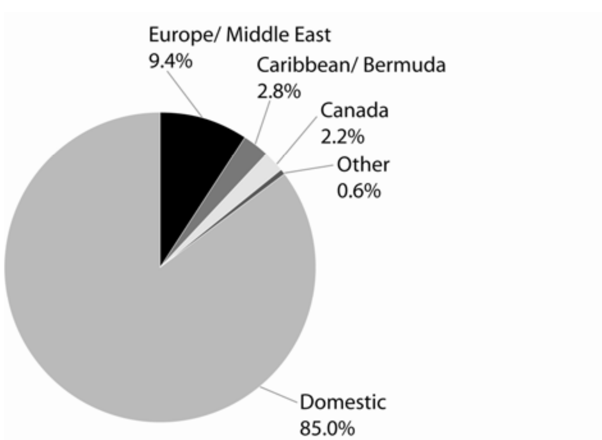
increased by 2.4 percent over 2005 levels to 27.7 million passengers (only 1,400 fewer passengers than in 2000), as shown in Table 2-1. Logan Airport's 2.4 percent increase in 2006 compares to a 0.7 percent increase for the nation as a whole.[1] As shown in Table 2-1, domestic passengers, Logan Airport's largest market segment, increased by 3.6 percent and accounted for 85 percent of total passengers. The average non-stop stage length of scheduled domestic flights from Logan Airport in 2006 was 711 miles. Figure 2-1 shows the distribution of Logan Airport passengers by market segment.

Table 2-1 Air Passengers by Market Segment

	2004	2005	2006	Percent of Total Passengers in 2006	Percent Change (2005-2006)
Domestic	**21,830,294**	**22,728,788**	**23,556,382**	**84.96%**	**3.64%**
International	**4,201,638**	**4,237,105**	**4,049,595**	**14.61%**	**(4.43%)**
Europe/ Middle East	2,590,225	2,629,823	2,599,382	9.38%	(1.16%)
Canada	622,098	682,904	621,185	2.24%	(9.04%)
Bermuda/ Caribbean	911,757	845,863	784,477	2.83%	(7.23%)
Asia/Pacific	0	0	0	0.00%	--
Central/South America	77,558	78,515	44,551	0.16%	(43.26%)
General Aviation (GA)	**110,584**	**122,012**	**119,466**	**0.43%**	**(2.09%)**
Total Passengers	**26,142,516**	**27,087,905**	**27,725,443**	**100.00%**	**2.35%**

Source: Massport.
NA Not Available.

Figure 2-1 Distribution of Logan Airport Passengers by Market Segment (2006)



Source: Massport.

1 U.S. Department of Transportation T100 Database.

International traffic at Logan Airport declined 4.4 percent from 2005 levels. Europe/Middle East remains the dominant destination market, accounting for 9.4 percent of total traffic and 64.2 percent of international traffic. Air traffic to Europe decreased by 1.2 percent. Because the remaining international destinations draw relatively few passengers from Logan Airport (1.5 million passengers, or 5.2 percent of the total), large percentage traffic swings result from relatively small absolute variations in passenger journeys. After a 9.8 percent increase between 2004 and 2005, traffic to Canada declined by 9.0 percent, a decrease of 61,700 passengers. Latin American traffic declined by 43.3 percent, but this represents a decline of just 34,000 passengers, one-tenth of 1 percent of total annual Airport passengers.

The overall decline in international passenger traffic was unexpected given U.S. carriers' increases in international service over the past several years. The experience at Logan Airport differed from the overall trend as most U.S. carriers chose to add new international routes and frequencies from their hubs to secondary cities (mostly in Europe). For the U.S. as a whole, international passengers rose by 3.9 percent, and international service at Logan Airport was largely unchanged with a net increase of one destination and a decrease of four flights per week. The average international fare from Logan Airport increased 4.4 percent from 2005 to $475; the fare increase was consistent with the national trend.[2]

Aircraft Operations in 2006

Total aircraft operations at Logan Airport declined from 409,066 in 2005, to 406,119 operations in 2006, a decrease of 0.7 percent (Table 2-2). Aircraft operations declined despite rising passenger numbers, because airlines increased their load factors (the number of passengers per aircraft operation). Changes in fleet types (and operations as a whole) have largely stabilized at Logan Airport.

There are three main types of passenger jets: wide-bodies, narrow-bodies, and regional jets. Wide-body aircraft are mostly used for long, international flights and tend to carry 200 or more passengers. The term 'wide-body' is derived from the two-aisle design of the cabin, a configuration Boeing engineers designed in order to fit two standard cargo pallets side-by-side in the cargo hold. Examples of the type in current service include the Boeing 767, 777, and 747, as well as the Airbus A330 and A340. Narrow-body aircraft, such as the Boeing 737 and Airbus A320, make up the bulk of the mainline domestic fleet. These aircraft have a single aisle and typically carry 120 to 150 passengers, although there are examples of smaller and larger aircraft in this group. Regional jets (RJs) historically carried approximately 50 passengers, although the category is expanding up the size range, and the newest RJs carry up to 100 passengers. Having the three categories of aircraft and the various different aircraft within each category allows airlines to make their operations more efficient by adjusting their capacity to suit demand.

The average number of seats per scheduled passenger flight from Logan Airport was 98 in 2006, up from a low of 87 in 1993. Since 2002, the average number of seats per flight at Logan Airport has been higher than the national average. The national average aircraft size continues to decline, while the average size of aircraft departing Logan Airport appears to have stabilized at about 98 seats for 2005 and 2006. The average size of a RJ departing Logan Airport was 54 seats in 2006, up from 40 in 2004. This increase reflects the introduction of some 75 and 100-seat RJs by JetBlue and US Airways.

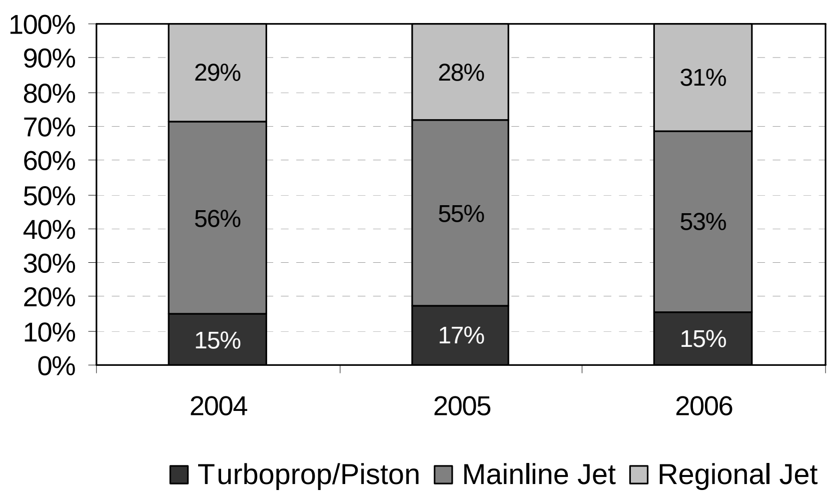
2 US DOT DB1B Database.

Table 2-2 Logan Airport Aircraft Operations

Category	2004	2005	2006	Percent of Total (2006)	Percent Change (2005-2006)
Operations by Aircraft Class					
Jet	245,397	236,221	**241,526**	59.47%	2.25%
Regional Jet	102,039	113,886	**110,554**	27.22%	(2.93%)
Non-Jet	57,823	58,960	**54,039**	13.31%	(8.35%)
Total Operations	**405,258**	**409,066**	**406,119**	**100.00%**	**(0.72%)**
Operations by Type and Aircraft Class					
Passenger Jet	212,723	201,502	**206,467**	50.84%	2.46%
Passenger Regional Jet	102,039	113,886	**110,554**	27.22%	(2.93%)
Passenger Non-Jet	49,672	52,114	**48,663**	11.98%	(6.62%)
Total Passenger Operations	**364,433**	**367,501**	**365,684**	**90.04%**	**(0.49%)**
GA Jet Operations	23,085	25,806	**26,566**	6.54%	2.95%
GA Non-Jet Operations	8,151	6,846	**4,878**	1.20%	(28.75%)
Total GA Operations	**31,236**	**32,652**	**31,444**	**7.74%**	**(3.70%)**
Cargo Jet	9,589	8,913	**8,493**	2.09%	(4.71%)
Cargo Non-Jet	0	0	**498**	0.12%	NA
Total Cargo Operations	**9,589**	**8,913**	**8,991**	**2.21%**	**0.88%**

The change in the mix of scheduled passenger flights at Logan Airport over the last three years is shown in Figure 2-2. Most significantly, non-jet operations, which accounted for more than 50 percent of total scheduled flights in the early 1990s, now represent just 15 percent of scheduled operations.

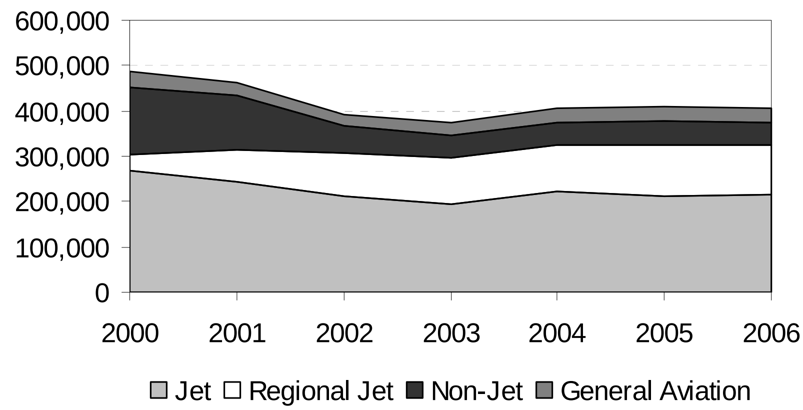
Figure 2-2 Mix of Scheduled Passenger Aircraft Operations at Logan Airport by Aircraft Class



Source: Official Airline Guide, (August 2004 through August 2006).
Note: All totals based on scheduled August departures. Percentages may not add due to rounding.

General Aviation (GA) operations decreased by 3.7 percent and all-cargo operations rose 0.9 percent from 2005 levels. Together, GA and cargo operations represent 10 percent of total aircraft operations at Logan Airport. Figure 2-3 depicts the changes in Logan Airport aircraft operations since 2000.

Figure 2-3 Aircraft Operations at Logan Airport by Aircraft Class



Source: Massport.
Note: GA operations include jet and non-jet aircraft.

Passengers and Operations Trends in 2006

Air carriers showed further gains in operational efficiency in 2006 as the average number of passengers per aircraft operation continued to increase. In 2006, Logan Airport operations accommodated an average of 68.3 passengers per flight compared to 66.2 passengers in 2005, as shown in Table 2-3. The average number of passengers per flight has risen by 5.9 percent since 2004. This is a reflection of the airlines' continued emphasis on capacity rationalization and strong underlying demand for air travel. The load factor on flights from Logan Airport has historically been below the national average. In 2006, the average domestic load factor for flights at Logan Airport was 72.4 percent, compared with a load factor of 70.8 percent in 2005 and a national average of 78.1 percent.

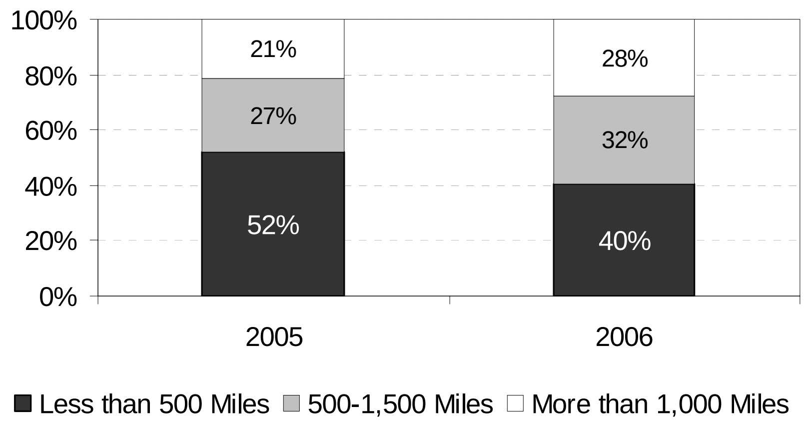
Table 2-3 Air Passengers and Aircraft Operations

Year	Air Passengers	Percent Change	Aircraft Operations	Average Passengers per Operation	Net Change From Previous Year
2004	26,142,516	14.70%	405,258	64.5	3.4
2005	27,087,905	3.62%	409,066	66.2	1.7
2006	27,725,443	2.35%	406,119	68.3	2.1

Source: Massport.

One of the long-term trends in the market is a shift towards longer flights (Figure 2-4). Generally, short flights, such as the Boston-New York shuttle, are to business destinations which can be reached easily by ground transportation. Increased security and decreased service after September 2001 made these short-haul flights less attractive to business passengers, which has reinforced this trend.

Figure 2-4 Length-of-Haul of Passenger Flights from Logan Airport



Source: OAG Schedules.

Airline Passenger Service in 2006

In 2006, over 50 airlines provided scheduled or charter passenger service from Logan Airport to more than 111 nonstop destinations. This section describes the major changes in Logan Airport's scheduled passenger services in 2006.

Changes in Domestic Passenger Service

American Airlines, Delta Air Lines, US Airways, JetBlue, and Cape Air were the largest carriers at Logan Airport in 2006 based on aircraft operations. Delta Air Lines overtook US Airways to claim the second position with 61,600 operations compared to 69,400 for American Airlines. JetBlue entered the top five by overtaking United Airlines and Cape Air to claim the fourth position with 32,500 operations. The number of domestic jet flights increased by 4 percent from 2005, offsetting a decrease of 5 percent in regional/commuter traffic and a 45 percent decline in charter traffic. Total domestic passenger operations increased by 0.1 percent for the year.

There were notable changes in the makeup of low-cost carrier (LCC) service at Logan Airport in 2006. In its third year in Boston, JetBlue accounted for 32,000 operations at Logan Airport, an increase of 100 percent over its 2005 total, and was the Airport's largest LCC and fourth-largest carrier. In December 2006, JetBlue offered 58 daily departures from Logan Airport and served 22 nonstop destinations. AirTran Airways, another incumbent LCC, increased its operations at Logan Airport by 35.5 percent in 2006 to 19,700 annual operations. AirTran Airways served 10 markets with 29 daily flights in December 2006. Offsetting this trend, Delta Air Lines incorporated Song, its low cost operation, back into the mainline carrier, Independence Air entered bankruptcy and was liquidated, and America

Trans Air stopped serving Boston. Table 2-4 summarizes the changes in domestic passenger airline operations at Logan Airport between 2004 and 2006.

Table 2-4 Air Passengers and Aircraft Operations

Category	2004	2005	2006	Change 2005-2006	Percent Change
Total Jet Operations	193,599	190,991	198,598	7,607	3.98%
Legacy/Charter Carriers	146,411	137,422	138,175	753	0.55%
Low Cost Carriers	47,188	53,569	61,114	7,545	14.08%
Regional/Commuter	130,272	137,203	130,298	(6,905)	(5.03%)
Charter Carriers	507	664	365	(299)	(45.03%)
Total Domestic	324,378	328,858	329,261	403	0.12%

Source: Massport.

Changes in Domestic Markets Served

- New nonstop service to several destinations was provided in 2006, including Austin, TX; Nashville, TN; Dayton, OH; and Trenton, NJ. JetBlue added one of the new routes from Boston while Delta Air Lines added three.
  - Austin is now served by JetBlue with one flight per day; the route had service for several months in 2001 prior to September 2001.
  - Nashville was served by American Airlines from 2000 through 2002; it was served by Delta Air Lines with an average of one daily flight beginning in April 2006.
  - Dayton is now served by Delta Air Lines five days per week. The route was added in December 2006.
  - Delta Air Lines added two flights per day to Trenton beginning in December using CRJ-200s flown by Comair.
- Among existing Logan Airport markets, JFK and Baltimore/Washington International saw the largest absolute increases in service. JFK service increased from 14 flights per day to 24 due to JetBlue's addition of a shuttle service on the route using Embraer 190s. Delta Air Lines added several flights per week to Baltimore/Washington, offsetting small service decreases by American Airlines and AirTran Airways.
- Services declined in a number of domestic markets as airlines continued to downsize and adjust their air service strategies at Logan Airport and around the nation.
  - Airlines ceased direct scheduled service between Logan Airport and Wilkes-Barre/Scranton, PA, New Orleans, LA, and Portland, ME; Continental stopped Wilkes-Barre and Portland service after December 2006; and Delta Air Lines ended Portland service in November 2006 after reducing service from four flights per day to one.
- Large declines in service occurred in three very different types of markets: the shuttle routes to New York, the Florida vacation markets, and some small, regional markets.
  - The La Guardia shuttle lost two flights per day and the Washington National shuttle lost three flights per day. Both routes saw small decreases in service by all three carriers on each route: American Airlines, Delta Air Lines, and US Airways.

- Orlando lost an average of one daily flight, a 13 percent decline in flight frequency, and Fort Lauderdale and Tampa lost flights as well. American Airlines ended service in the Boston-Orlando market, and JetBlue and Delta Air Lines reduced capacity beginning in the spring. However, AirTran Airways began new service on the route in December 2006.
- Several smaller routes saw large declines in service quality in 2006. Burlington, VT, which was served by five flights per day in 2005, received only three flights after Continental, the only carrier on the route, cut service in January 2006. Continental also reduced service to Westchester County by four flights per day to one daily flight, while US Airways reduced service by one flight per day. Carriers also reduced operations to Albany, Bangor, and Islip during 2006.

A complete listing of all changes in scheduled departures by domestic destination is in *Appendix E, Activity Levels*.

Changes in International Passenger Service

Total international passenger operations declined by 7.5 percent in 2006, as summarized in Table 2-5. (For detailed tables of changes in operations by carrier, see *Appendix E, Activity Levels.*) The largest declines for scheduled traffic were in the Canada sector, where passenger operations decreased by 10.7 percent. The Europe/ Middle East market, which is Logan Airport's second largest international market in terms of operations and the largest in passengers, experienced a 2 percent decrease in aircraft operations.

Changes in International Markets Served during 2006

Most changes in international service occurred on seasonal routes: Air Canada ended its summer service to Vancouver, British Columbia; Finnair moved its 2005 Nykoping service to Stockholm-Arlanda for 2006; and SATA International offered new service to the Azores between June and August. US Airways offered winter service to Punta Cana, in the Dominican Republic, from January to April. TACV-Cabo Verde ended direct service to Ile de Sal, in the Cape Verde islands, at the beginning of 2006.

Table 2-5 International Passenger Operations by Market Segment

Category	2004	2005	2006	Percent Change (2005-2006)	Average Annual Growth (2004-2006)
Scheduled	**38,588**	**37,575**	**35,003**	**(6.84%)**	**(4.76%)**
Europe/Middle East	12,085	12,206	11,954	(2.06%)	(0.54%)
Canada	18,639	18,914	16,893	(10.69%)	(4.80%)
Bermuda/Caribbean[1]	6,838	5,594	5,710	2.07%	(8.62%)
Central/South America	1,026	861	446	(48.20%)	(34.07%)
Non-Scheduled	**1,467**	**1,068**	**727**	**(31.93%)**	**(29.60%)**
Total	**40,055**	**38,643**	**35,730**	**(7.54%)**	**(5.55%)**

Source: Massport.
1 Includes Puerto Rico and U. S. Virgin Islands.

2006 Cargo Activity Levels

In 2006, Logan Airport ranked 22nd among US airports in total cargo volume.[3] Cargo at Logan Airport is carried in the belly compartments of passenger aircraft or by dedicated all-cargo carriers, such as Federal Express, Airborne Express, and United Parcel Service, in all-freight aircraft. The express/small package segment dominates Logan Airport cargo activity, accounting for 62.1 percent of the total non-mail cargo volume. Table 2-6 shows all-cargo aircraft operations and cargo volumes at Logan Airport since 2004. All-cargo operations at Logan Airport increased marginally in 2006 despite falling cargo volumes.

In 2006, the express/small packages and freight volumes dropped below 2005 levels, and airmail volume continued to decline. One of the important factors in the use of air cargo is the reliability of ground freight. As trucking companies have adopted time-definite delivery service, air cargo has become less important in the freight market as a whole.

Federal Express carried 42.8 percent of the total volume of air cargo and mail in and out of Logan Airport in 2006 and was the 18th largest carrier at the airport in terms of total flights. United Parcel Service carried an additional 11.6 percent of total cargo in 2006. Passenger airlines carried 37.7 percent, or 270 million pounds, of cargo in 2006.

Table 2-6 Cargo and Mail Operations and Volume

	2004	2005	2006	Percent Change (2005-2006)	Average Annual Growth (2004-2006)
All-Cargo Aircraft Operations	9,589	8,913	8,991	0.85%	(3.18%)
Volume (lbs.)					
Express/Small Packages	478,584,154	472,605,966	422,173,699	(10.67%)	(6.08%)
Freight	280,690,836	268,911,342	256,894,390	(4.47%)	(4.33%)
Mail	48,412,006	43,728,414	37,269,744	(14.77%)	(12.26%)
Total	**807,686,996**	**728,245,722**	**679,068,089**	**(13.52%)**	**(8.31%)**

Source: Massport.
NA Not Available.

Airline Industry Analysis

State of the Airline Industry in 2006

The industry-wide recovery that began in earnest after the bankruptcy filings of Northwest Airlines and Delta Air Lines in September 2004 continued through 2006. Passenger enplanements, load factors, and fares all reached levels not seen since 2000. Delta Air Lines emerged from Chapter 11 bankruptcy protection on April 30, 2007, and Northwest Airlines did so on May 31, 2007. As shown in Figure 2-5, the U.S. network carriers (American Airlines, Continental, Delta Air Lines, Northwest Airlines, US Airways, and United Airlines) all

3 US DOT T100 Database.

reported operating profits for the full year; the last year in which all six carriers reported operating profits was 2000.

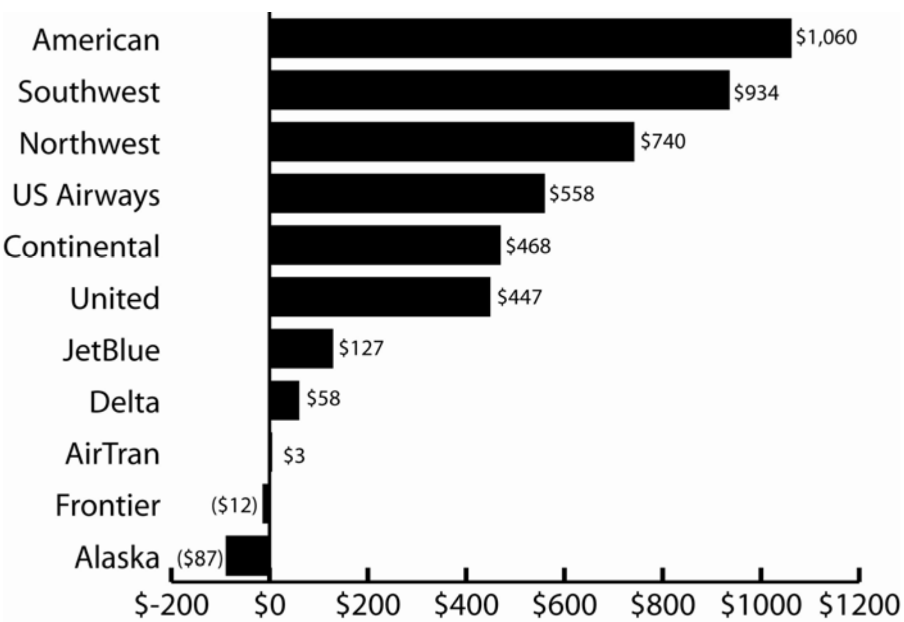
Figure 2-5 shows the operating profits of a group of major U.S. carriers in 2006. The figures are impressive given the recent history of the industry, but it is important to remember two things: first, that these are operating profits rather than net profits; second, while Southwest delivered an operating margin of 10 percent in 2006, the majority the other carriers posted margins of 5 percent or less.

Logan Airport served 27.7 million passengers in 2006, only 1,400 fewer passengers than in 2000. The growth of passenger traffic at Logan Airport was faster in 2006 than the national average; Logan Airport's passenger totals were up 2.4 percent from 2005, compared to national growth of less than 1 percent. However, while Logan Airport almost reached its 2000 passenger level in 2006, the industry as a whole passed that milestone in 2004.

In 2006, the U.S. industry reduced scheduled capacity by 3.7 percent (in seat-departure terms) from 2005 levels. Because capacity was declining and passenger enplanements were steady, domestic load factors were well above historical levels during each month in 2006 and reached a record national high of 84.9 percent in July 2006.

Strong demand has allowed the airlines to raise fares substantially. The average fare paid for a one-way trip in the domestic U.S. rose to $149.50, an increase of 9 percent from 2005, and the highest average fare in nominal terms since 2000.

Figure 2-5 U.S. Carrier Operating Profits/Losses in Millions of Dollars, 2006



Source: Carrier Reports.

Improvements in the operating environment were, in part, allowed by changes in the LCC markets. LCCs as a whole reduced their pace of growth to 6.5 percent – about two-thirds the pace of the previous two years. AirTran Airways slowed its deliveries of 737s from Boeing, JetBlue sold some of its older A320s, and Southwest faced difficulties in securing additional 737s. Strong demand encouraged LCC to raise fares to cope with rising fuel prices, which in turn allowed legacy carriers to do the same.

LCCs providing service out of Logan Airport in 2006 included JetBlue, AirTran Airways, Delta Song, and America West. Due to large increases in service by JetBlue and AirTran Airways, the number of operations performed by LCCs at Logan Airport increased 14.1 percent over 2005 levels despite Independence Air's demise, Delta Air Lines' decision to fold Song back into the mainline carrier, and ATA's decision to exit the Boston market altogether. In 2006, Logan Airport offered nearly twice as much daily LCC seat capacity as T.F. Green Airport and nearly 2.5 times Manchester Boston Regional Airport's capacity.

JetBlue carried 11.8 percent of Logan Airport passengers and performed 8.9 percent of operations in 2006. The airline operates Airbus A320s, and Embraer E190s out of Terminal C. The Airbus aircraft currently have 156 seats, but the airline is reducing that to 150 seats to lower the number of flight attendants needed. The Embraer 190 is a 100-seat aircraft. Although JetBlue began flying with a single aircraft type – the A320 – it has added the Embraer 190 to its fleet to better serve smaller markets. The Embraer 190 has facilitated JetBlue's expansion at Logan Airport – nearly half of scheduled departures are flown using the Embraers. JetBlue has also begun a high-frequency shuttle service to JFK, mostly using the Embraer 190s.

One sign of change in the LCC model is JetBlue's reversal of its approach to Global Distribution Systems (GDS). GDSs are computer reservation systems that connect travel agents to airline inventories. JetBlue avoided selling its tickets through GDSs for several years in order to promote its website with fare sales and avoid the commissions that those systems charge. In April, 2007, the airline announced that it would sign 'full-content' agreements with two GDS providers. The move restricted the airline's ability to offer special fares on its website, but gave it improved access to higher-yielding business traffic. After years of cost-focused restructuring efforts this type of revenue-focused strategy became more prominent in the industry as a whole in 2006.

Of JetBlue's 2006 Boston origin and destination passengers, approximately 42 percent traveled between Boston and the Florida vacation markets (primarily Orlando, Fort Lauderdale, Ft. Myers, and Tampa), 11.1 percent to JFK, and 8.8 percent to Washington Dulles. JetBlue scheduled an average of 45 flights per day in 2006; 21.6 percent were to JFK, where JetBlue maintains a substantial focus-city operation. The airline also offers service in transcontinental markets, including Long Beach, CA; Oakland, CA; and Seattle, WA. In 2005, JetBlue scheduled an average of 20 flights per day from Logan Airport, of which 59.6 percent were bound for Florida markets and just 4 percent were bound for JFK Airport.

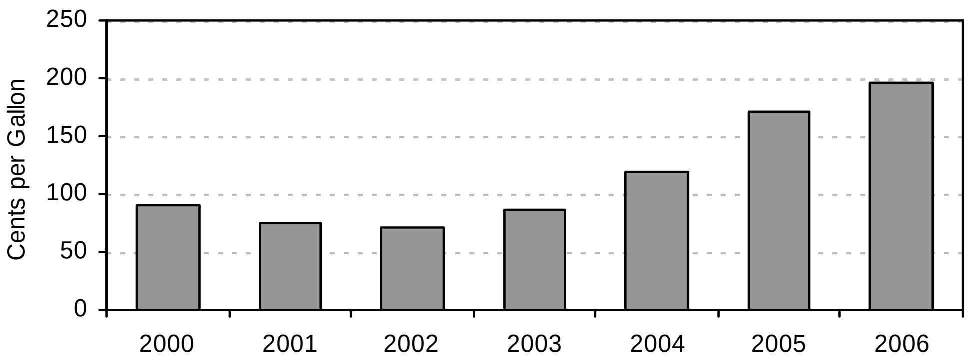
The airlines' future will be decided by their ability to respond to some significant challenges in the coming years. Major U.S. carriers were able to generate operating profits in 2006, but their fleets are aging, their workers are agitating for higher wages after years of furloughs and wage concessions, and any increase in price of jet fuel could reverse recent industry gains.

Conflict in the Middle East, the source of 24 percent of oil imported to in the U.S.[4] continues to generate long-term uncertainty and short-term volatility in the energy markets. Because U.S. airlines use nearly 20 billion

4 Energy Information Administration, April 17, 2007.Top 15 source countries of petroleum only.

gallons of jet fuel per year, a $0.01 change in the price of jet fuel can cause a $200 million swing in profits (or losses). Figure 2-6 shows the change in the market price of a gallon of jet fuel for recent years.

Figure 2-6 New York Harbor Jet Fuel Spot Price

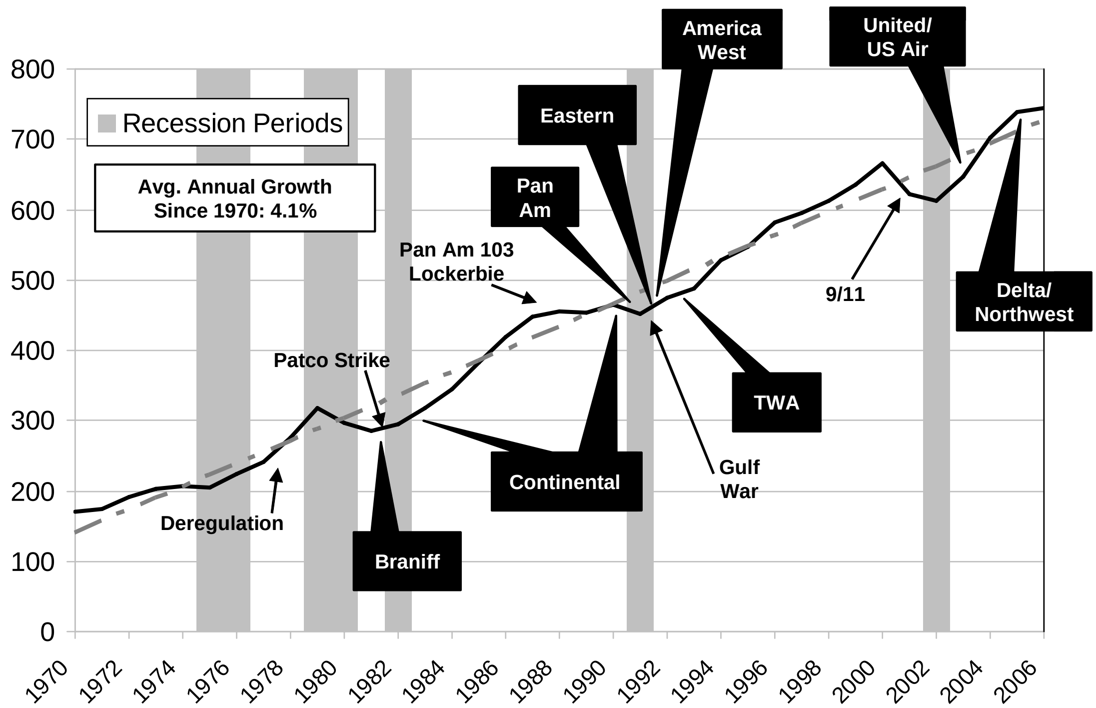


Source: Energy Information Administration.

Currently, there is no new narrow-body aircraft similar in size to the Boeing 737 and Airbus 320 to replace these workhorse aircraft. Airbus has experienced production problems and delays on the A380 and is redeveloping the A350 to better compete with the Boeing 787. Boeing is focused on successfully implementing the 787 program before it will begin work on another new aircraft family. Therefore, it is unlikely that there will be a new generation of more fuel-efficient narrow-bodies until 2012 or later. This delay means that U.S. airlines will not have the opportunity to make a large dent in their domestic fuel consumption for the next several years, leaving them largely exposed to fuel price volatility during that span.

Given the industry's strong results in 2006, it appears unlikely that a major U.S. carrier will fail in the next several years. However, the history of the aviation market has been characterized by frequent shocks (Figure 2-7), which can quickly jeopardize airlines' financial performance. In general, the industry will continue to grow, as long as the economy as a whole continues to grow. If an airline fails, the capacity it offered will generally be replaced by new or existing airlines. Other carriers (particularly Delta Air Lines) replaced Eastern Airline's Logan Airport service when Eastern liquidated in the early 1990s; as long as Boston's local economy (and therefore its demand for air travel) remains strong, remaining carriers will do the same in the future.

Figure 2-7 Recessions and Industry Bankruptcies (Passenger Enplanements in Millions)



Source: Air Transport Association.

3

Airport Planning

Introduction

This chapter provides a status report on projects completed at Logan Airport in 2006, and outlines plans for future projects that are under consideration by Massport or its tenants through 2020. A discussion of commercial parking planning and development at Logan Airport is also presented at the end of this chapter.

As discussed in *Chapter 1, Introduction/Executive Summary* of this *2006 Environmental Data Report (2006 EDR)*, any proposed project that triggers a threshold under the Massachusetts Environmental Policy Act (MEPA) or the National Environmental Policy Act (NEPA) will undergo the appropriate project-specific state and/or federal environmental review.

2006 Planning Highlights

The following projects were completed in 2006:

- The new Terminal A, which opened on March 16, 2005, achieved Leadership in Energy and Environmental Design (LEED™) certification in June 2006. It is the first airport terminal in the United States (U. S.) to earn this ranking.

- The Silver Line is the most recent addition to the metropolitan area transit system and is Boston's first Bus Rapid Transit (BRT) line. Initial Silver Line service to Logan Airport began in December, 2004. In November, 2006 Silver Line service was enhanced with the addition of the Massachusetts Bay Transportation Authority's (MBTA) Charlie Card automatic fare collection kiosks in all Logan Airport terminals. Charlie Card kiosks are found in a total of seven locations at the Airport. This MBTA/Massport joint venture fulfilled a long-standing goal to provide MBTA subway/rapid transit ticketing in the Logan Airport terminals.

- Construction of the North Service Road (SR-2) Roadway Buffer was completed in 2006. The buffer consists of a sidewalk linking the Blue Line Airport Station to Logan Airport Terminals, and a landscaped area adjacent to the sidewalk.

- Construction of Phase 1 of the Southwest Service Area (SWSA) buffer began in 2005 and was completed in the fall of 2006. Phase 1 consists of landscaping and lighting improvements along Maverick Street.

- The Navy Fuel Pier Edge Buffer was completed in December 2006. The Navy Fuel Pier Edge Buffer provides a landscaped buffer between the East Boston Community and Logan Airport. Its design included bank stabilization, landscaping improvements such as plantings, fencing, rustic boulder seating, and a walkway.

Navy Fuel Pier Edge Buffer

Table 3-1 provides a summary of the status of each project and planning concept, as of December 31, 2006. Descriptions are provided in subsequent sections of this chapter.

Table 3-1 Logan Airport Projects and Planning Concepts 2006

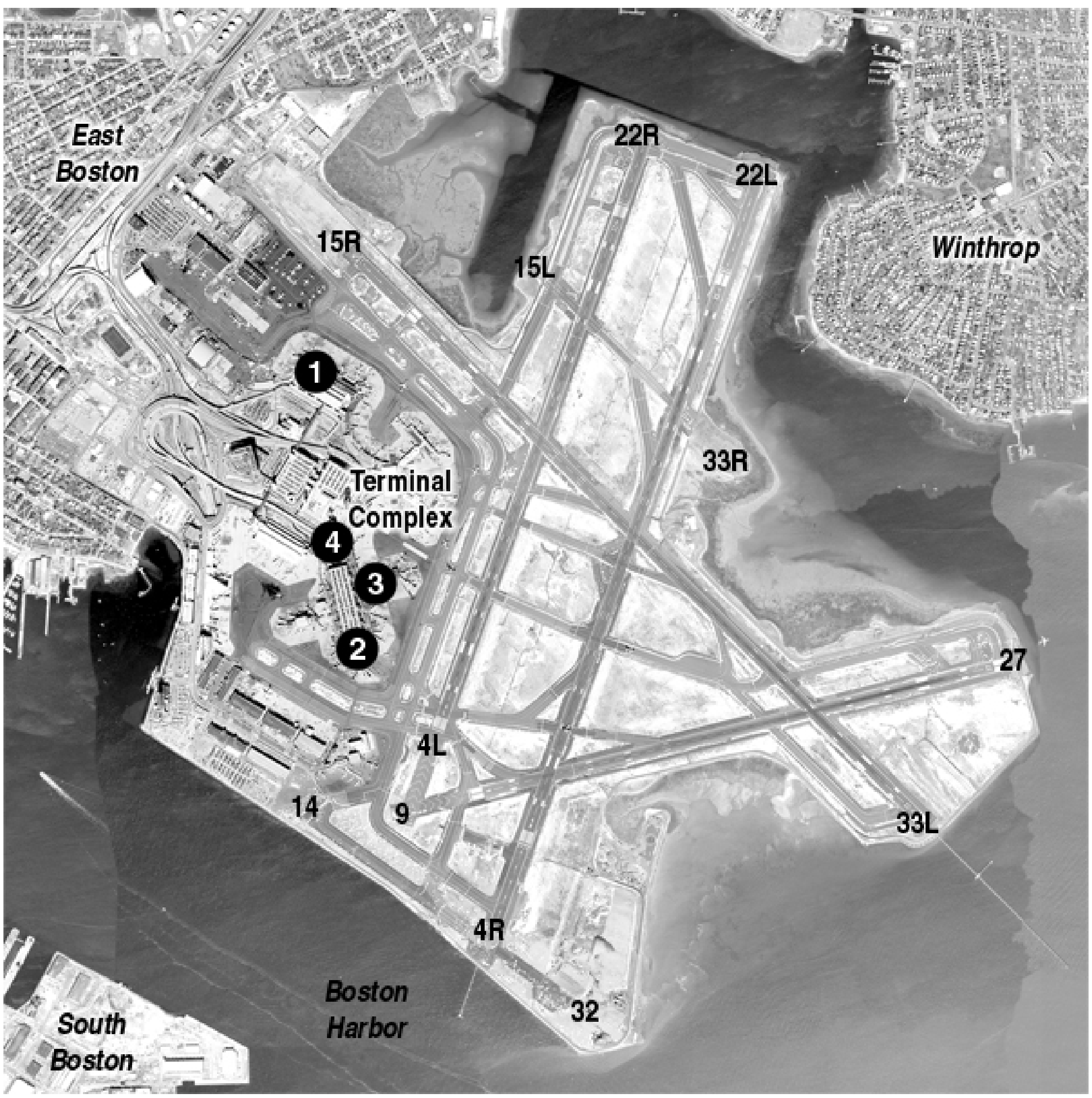
Description	Status	Completion By 2010	Completion By 2020		Status	Completion By 2010	Completion By 2020
Terminal Area Projects/ Planning Concepts				**Buffer Projects/ Planning Concepts**			
International Gateway Project (Terminal E)				SR-2 Roadway Buffer	C		
Phase 1	C			Navy Fuel Pier Buffer	C		
Phase 2	U	✓		SWSA Buffer	C (Phase 1)/ H (Phase 2)		
Future Phase	M/H	✓		NSA Buffer	H	✓	
Massport Satellite FIS Facility Project	H			Bremen Street Park (CA/T Project)	U	✓	
American Airlines Terminal B, Pier A Improvements Project	H						
Terminal B Walkway Extension	H			**Airport-Wide Projects/ Planning Concepts**			
				Logan Airport Landscaping	E/U	✓	
Service Area Projects/ Planning Concepts				Logan Airport Wayfinding System	U	✓	
Robie Parcel Development/Cargo Facility in the NCA	M/E		✓				
Relocated CNG Station in the NCA	E		✓	**Commercial Parking Projects/ Planning Concepts**			
Consolidated Maintenance Facilities in the NCA	U/D	✓		West Garage Project - Phase II	U	✓	
Replacement General Aviation Facility in the NCA	U	✓		NSA Economy Parking Consolidation	U	✓	
Replacement Cargo Facilities in the NCA	E		✓	Replacement Parking Facility	U	✓	
Replacement American Airlines Hangar in the NCA	H		✓	Commercial Parking Facilities	E		✓
Replacement Hangar Facilities in the NCA	H		✓	Consolidated Rental Car Facility	E		✓
Replacement Gas Station Facility in the NCA	E		✓				
Flight Kitchen Consolidation in the NSA	H		✓				
New/Replacement GSE Consolidated Facility in the NCA	E		✓				
Airside Area Projects/ Planning Concepts							
Runways 22R and 33L Runway Safety Area Enhancements	E	✓					
Security Wall	U	✓					
Logan Airside Improvements Planning Project	M	✓					
Runway 14-32	C						
Taxiway Improvements	D	✓					
Centerfield Taxiway	D	✓					
Governors Island Aircraft Parking	E		✓				

Notes: Anticipated completion dates and status as of December 31, 2006. Details of each project or planning concept are provided in the sections that follow.
E – Planning concepts undergoing evaluation and/or feasibility analysis
M – MEPA Permitting complete (if required)
H – Project or planning concept on hold
R – Project undergoing MEPA, Federal Aviation Administration (FAA), or other review
U – Project under construction
D – Project in design
C – Completed in 2006

Terminal Area Projects/Planning Concepts

The terminal area accommodates most of the passenger functions at Logan Airport including the airline terminals, terminal area roadways, central parking facilities, and the Hilton Hotel. Table 3-2 presents information on the status of each ongoing terminal area project. In addition, both Massport and its tenants at Logan Airport are proposing projects or exploring planning concepts to modernize and carry out future improvements to the existing terminal facilities. These potential future planning concepts are also detailed in Table 3-2. The location of the ongoing terminal area projects and the planning concepts that may potentially be constructed in the future are shown on Figure 3-1.

Figure 3-1 Location of Projects/Planning Concepts in the Terminal Area



Note: Aerial photo taken February 2006. Runway 14-32 construction completed in November 2006.

Table 3-2 Description and Status of Projects/Planning Concepts in the Terminal Area (as of December 31, 2006)

Description	Status
Massport Projects/Planning Concepts	
1. International Gateway Project (Terminal E) The International Gateway Project expands and upgrades Terminal E to provide better service to international passengers. This project is being constructed in phases:	
Phase 1 –This phase of the project included a weather-protected outside airside bus portico with an elevator and escalator linking the ground floor with the second floor to accommodate passengers arriving from remotely parked aircraft that are unable to park at a gate because it is occupied by another aircraft.	Construction of the International Gateway Project commenced in the summer of 1998. Phase 1 was completed in 2004.
Phase 2 – This phase of the project enlarges Logan Airport's congested Federal Inspection Services (FIS) Facility, and improves the meeter/greeter lobby and the ticketing area of Terminal E to maximize passenger convenience and reduce processing times in the terminal. The project reconstructs and expands Terminal E in and around the existing terminal while keeping it operational and safe.	The departure level of the new $321 million terminal, including the new ticketing hall and departure level roadway, opened in May 2003. Construction of the new arrivals level continued and was completed in 2007. Other internal construction activities included new restrooms, additional security check points and tenant fit up. The new departure hall includes high ceilings, wood paneling, built-in artwork, and views of the city skyline. Additionally, to reduce curb and roadway congestion at Terminal E, this project also includes a new separated roadway system for arrivals and departures. Construction of the FIS Facility improvements was ongoing in 2006 and was completed in July 2007.
Future Phase – This phase involves the construction of a new West Concourse, which will add three new gates to Terminal E to accommodate wide body aircraft.	Initial work on the Future Phase (new West Concourse) was completed as part of an airport-wide in-line baggage screening project in 2004. Completion of this phase is anticipated before 2010.
2. Massport Satellite FIS Facility Improvements Project To accommodate more efficiently the potential growth of the international market, Massport proposed to construct a new satellite FIS Facility at the southeast end of Terminal B, Pier A.	Massport and American Airlines filed a joint Environmental Notification Form (ENF) on May 31, 2000 (EOEA #12235), a Draft Environmental Impact Report (DEIR) on May 9, 2001, and a Final Environmental Impact Report (FEIR) on June 23, 2001. On August 24, 2000, the Federal Aviation Administration (FAA) determined that the projects are categorically excluded from the need to prepare an Environmental Assessment (EA) under NEPA, and that the projects meet the General Conformity requirements of the Clean Air Act, as amended.[1] Due to the financial impacts of September 11, 2001, design and construction of the Terminal B FIS Facility has been placed on hold indefinitely. Status updates will be provided in subsequent EDRs until a decision is made to proceed with the project.

1 Letter from John Silva, Manager, Environmental Programs, Federal Aviation Administration, New England Region, to Ken Hietbrink, American Airlines, and Betty Desrosiers, Massport. Dated August 24, 2000.

Table 3-2 Description and Status of Projects/Planning Concepts in the Terminal Area (as of December 31, 2006) (Continued)

Description	Status
Tenant Projects/Planning Concepts	
3. American Airlines Terminal B, Pier A Improvements Project American Airlines proposed to consolidate all of its Boston operations, including its existing domestic and international operations, into one location. This would be accomplished by reconfiguring the existing gates at Terminal B, Pier A. Improved circulation, ticket space, baggage handling, concessions, and other amenities would be provided. This improvement would enable American Airlines to better accommodate passenger demands and anticipated future passenger growth.	Massport and American Airlines filed a joint ENF on May 31, 2000 (EOEA #12235), a DEIR on May 9, 2001, and an FEIR on June 23, 2001. On August 24, 2000, the FAA determined that the project is categorically excluded from the need to prepare an EA under NEPA, and that the project meets the General Conformity requirements of the Clean Air Act, as amended.[2] Due to the financial impacts of September 11, 2001, design and construction of the American Airlines Terminal B, Pier A Improvements Project has been placed on hold indefinitely. Status updates will be provided in subsequent EDRs until a decision is made to proceed with the project.
4. Terminal B Walkway Extension Massport considered extending the elevated walkway that connects the Central Garage and northwest corner of Terminal B to the US Airways entrance on the west side of Terminal B.	This project is currently on hold.

See Figure 3-1 for the location of terminal area projects/planning concepts.

Service Area Projects/Planning Concepts

Logan Airport's service areas contain airline support businesses and operations. Land uses in the service areas evolve continually in response to changing airline business, customer, and tenant needs, as well as the impact of the Central Artery/Tunnel (CA/T) Project and other public works projects. Massport continues to explore more efficient ways of using the limited land resources in the service areas. The five service areas at Logan Airport are shown in Figure 3-2 and are described below:

- **North Cargo Area** (NCA) is located in Logan Airport's northwest corner. It is bounded by the main Logan Airport outbound roadway to the south, Route 1A to the west, the Jet Fuel Storage Facility to the north, and the airside apron area to the east. The NCA, which is situated adjacent to the airside area of Logan Airport, is Logan Airport's primary airline support area. It accommodates air cargo and essential airline support businesses including hangars, ground service equipment (GSE) maintenance, and aircraft parking. The NCA is the most appropriate location for businesses and operations that require contiguous airside access and for businesses such as cargo that require adjacent landside as well as airside access. The NCA is the likely location for future hangar expansion either between or in the vicinity of the American Airlines and United Airways hangars, for replacement cargo buildings and for aircraft parking to accommodate changes in aircraft fleet over time.

- **North Service Area** (NSA) is located north of the NCA near the MBTA's Wood Island Station and Runway 15R-33L. The NSA includes flight kitchens, weather and navigation equipment, construction staging areas, and parking areas.

2 Ibid.

- **North Service Area** (NSA) is located north of the NCA near the MBTA's Wood Island Station and Runway 15R-33L. The NSA includes flight kitchens, weather and navigation equipment, construction staging areas, and parking areas.

- **Southwest Service Area** (SWSA) is located south of Logan Airport's main access roadway, and is bounded on the east by Harborside Drive. Because of its proximity to the terminals and the regional highway system, the SWSA functions as Logan Airport's primary ground transportation hub. Current surface operations include the taxi pool, bus/limousine pool, and rental car operations. An inflight kitchen is also located in the SWSA, although the kitchen may be relocated to the NSA.

- **Bird Island Flats/South Cargo Area** (BIF/SCA) is located south of the Logan Airport's SWSA, and is generally bounded on the east by Boston Harbor and on the west by Logan Airport's airside area. The BIF/SCA is two service areas connected by Harborside Drive. The BIF portion has landside access via Harborside Drive and water access via the system of water taxis that shuttle passengers between Downtown Boston, the South Shore, and Logan Airport. BIF development includes the Hyatt Hotel and Conference Center, the Logan Office Center and adjoining garage, an employee parking lot, the Water Shuttle Dock, the Logan Airport Rescue and Fire Fighting Facility Marine Dock, and the Harborwalk that is a publicly accessible promenade along the harbor's edge. The SCA portion is Logan Airport's primary cargo area. It provides landside access and secured airside access. It also accommodates domestic and some international cargo operations.

- **Governors Island** (GI) is located at Logan Airport's southern tip and is bounded by Runway 14/32 and Boston Harbor to the east and south, by Runway 4R to the west, and Runway 9 to the north. GI has functioned as a storage site for the CA/T Project and for construction stockpiles. The area also contains an Aircraft Rescue and Fire Fighting Facility training area, parking for snow removal equipment, a biocell remediation area, and FAA aircraft navigation equipment.

Table 3-3 presents information on the status of each ongoing project and planning concept in the service areas. Both Massport and Logan Airport's tenants are proposing projects or exploring planning concepts to modernize and carry out future improvements to the service areas. These potential future planning concepts are also detailed in Table 3-3. The location of the ongoing service area projects and planning concepts that may potentially be constructed in the future are shown on Figure 3-3.

Figure 3-2 Logan Airport Service Areas

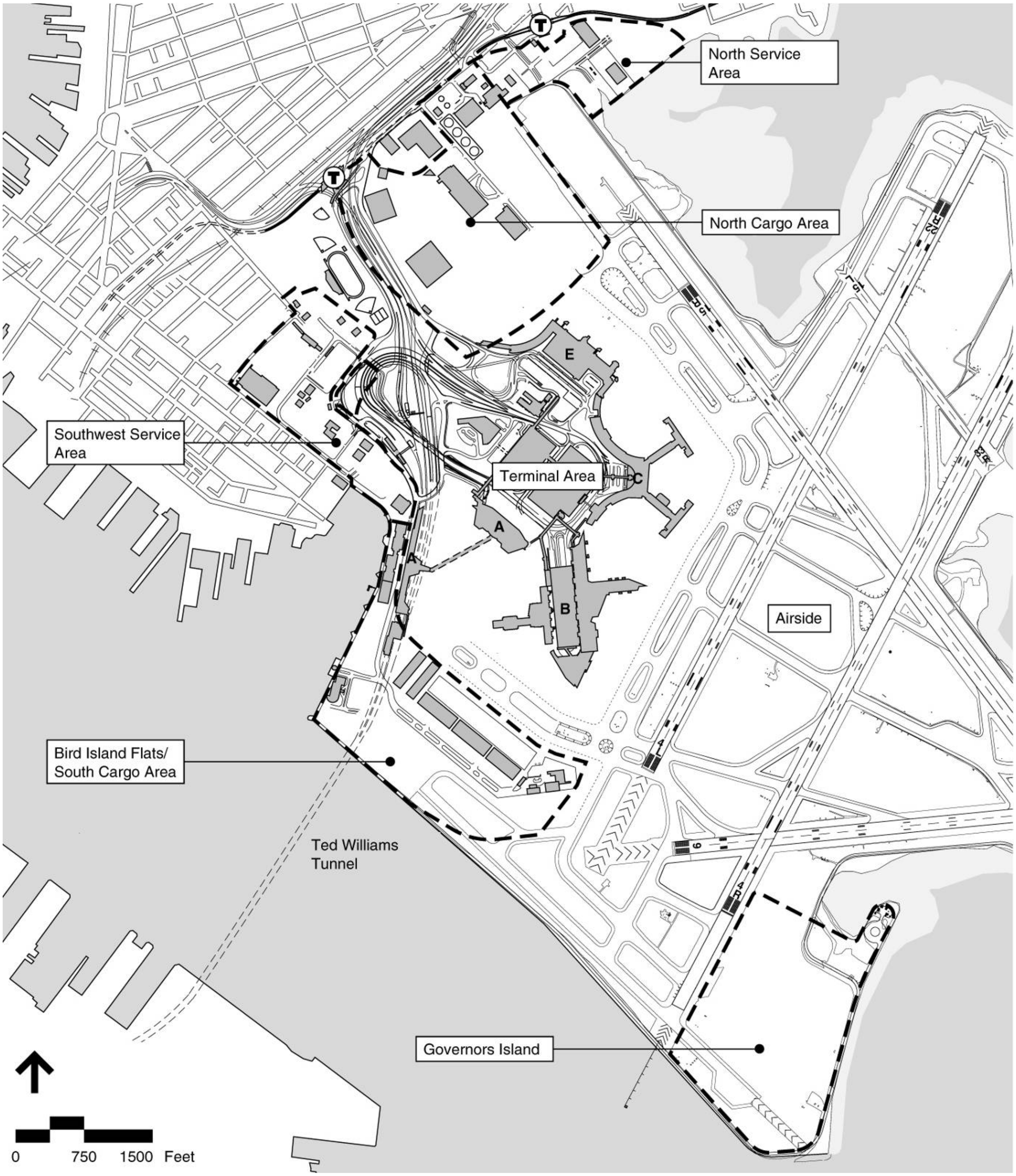
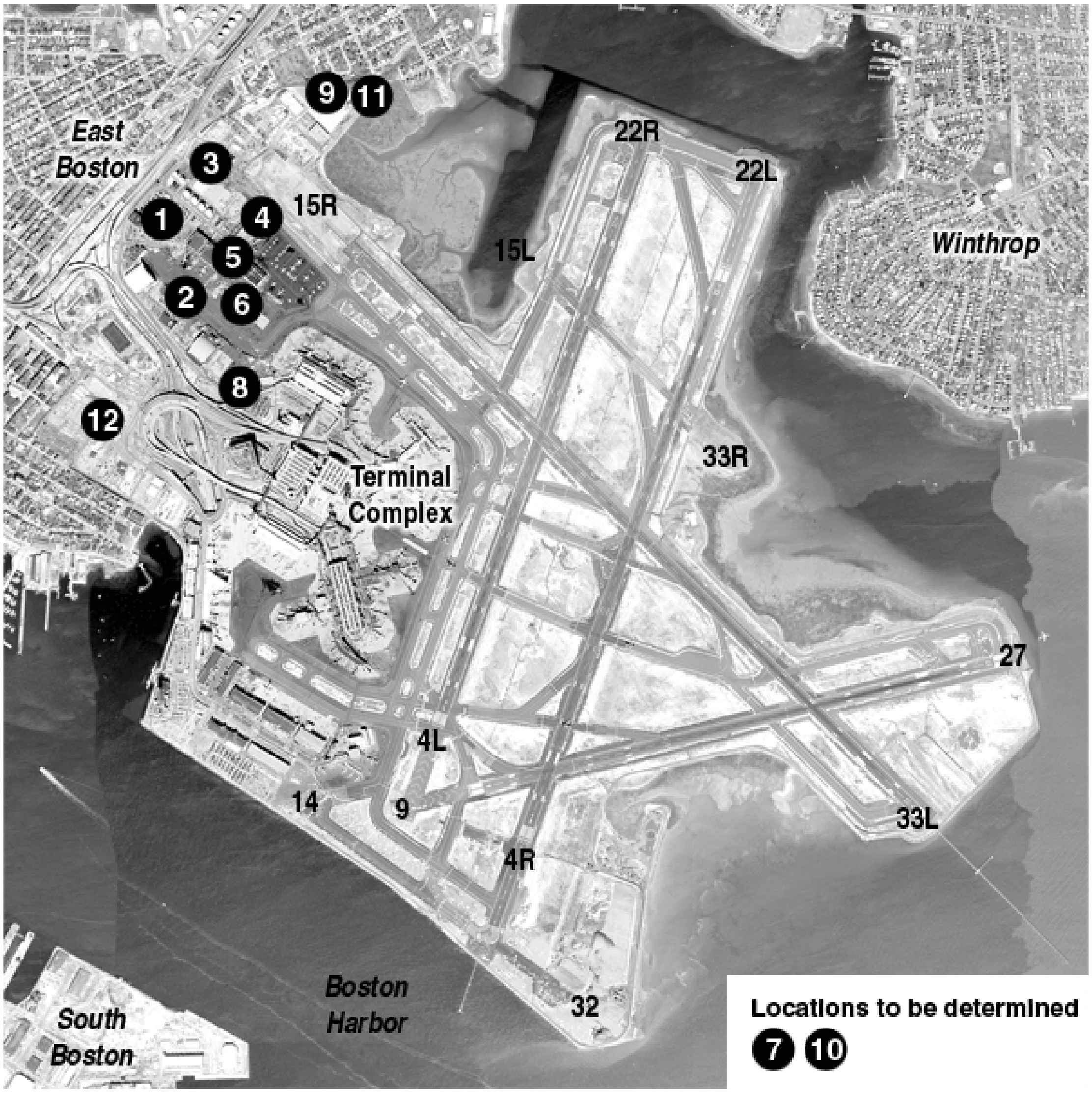


Figure 3-3 Location of Projects/Planning Concepts in the Service Areas



Note: Aerial photo taken February 2006. Runway 14-32 construction completed in November 2006.

Table 3-3 Description and Status of Projects/Planning Concepts in the Service Areas (as of December 31, 2006)

Description	Status
Massport Projects/Planning Concepts	
1. Robie Parcel Development/Cargo Facility in the NCA This would entail the development of a replacement cargo facility, construction of two aircraft parking positions, and a landscaped buffer (refer to Table 3-5 for details on the buffer portion of this project) adjacent to the SR-2.	In 2003, the United States Postal Service (USPS) had expressed interest in constructing a replacement cargo facility on the Robie Parcel. Following MEPA review, the USPS decided not to pursue the plan. Massport continues to explore opportunities to site a cargo facility and two aircraft parking spaces on this site, consistent with the MEPA decision. The project would not likely be constructed until after 2010.
2. Relocated Compressed Natural Gas (CNG) Station in the NCA This would involve the relocation of Massport's existing CNG Station to accommodate the Robie Parcel Redevelopment in the NCA and the completion of SR-2 by the CA/T Project.	Massport has identified several potential on-Airport parcels in the general vicinity of the NCA for relocation of the CNG station. Relocation is expected to occur in conjunction with construction of a Robie Parcel Replacement Cargo Facility.
3. Consolidated Maintenance Facilities in the NCA This would involve the construction of a new large vehicle storage building in the NCA to provide better storage capacity for essential snow maintenance equipment. Phase 1 would provide covered storage for large snow equipment adjacent to Facilities Building # 2. Existing deicing tanks will be replaced with larger capacity tanks and that will be relocated to an adjacent area. Phase 2 would involve major rehabilitation of the existing Facilities Building # 2.	Phase 1 construction began in 2006 and is anticipated to be completed in 2008 when Phase 2 construction is expected to commence.
4. Replacement General Aviation Facility in the NCA This would involve the development and operation of a first-class permanent general aviation (GA) facility at Logan Airport to replace the existing temporary GA facility. The new facility is contemplated to be located adjacent to the existing facility. The development plans include a passenger processing facility and a multi-tenant GSE facility.	Demolition of the existing temporary facility and construction of the new facility were completed in early 2007. Massport and Signature Flight Support will seek LEED™ certification[1] for the facility. It represents a high quality architectural design that is based on sustainable design, construction, and operational principles.
5. Replacement Cargo Facilities in the NCA Construction of new cargo facilities in the NCA would compensate for the loss of cargo facilities that resulted from the CA/T Project, as well as for the projected growth in cargo demand.	This concept is currently under preliminary evaluation. If a decision is made to proceed with this project, permitting and construction would likely commence before 2010.

1 The LEED™ Green Building Rating System is a voluntary, consensus-based national standard for developing high-performance, sustainable buildings.

Table 3-3 Description and Status of Projects/Planning Concepts in the Service Areas (as of December 31, 2006) (Continued)

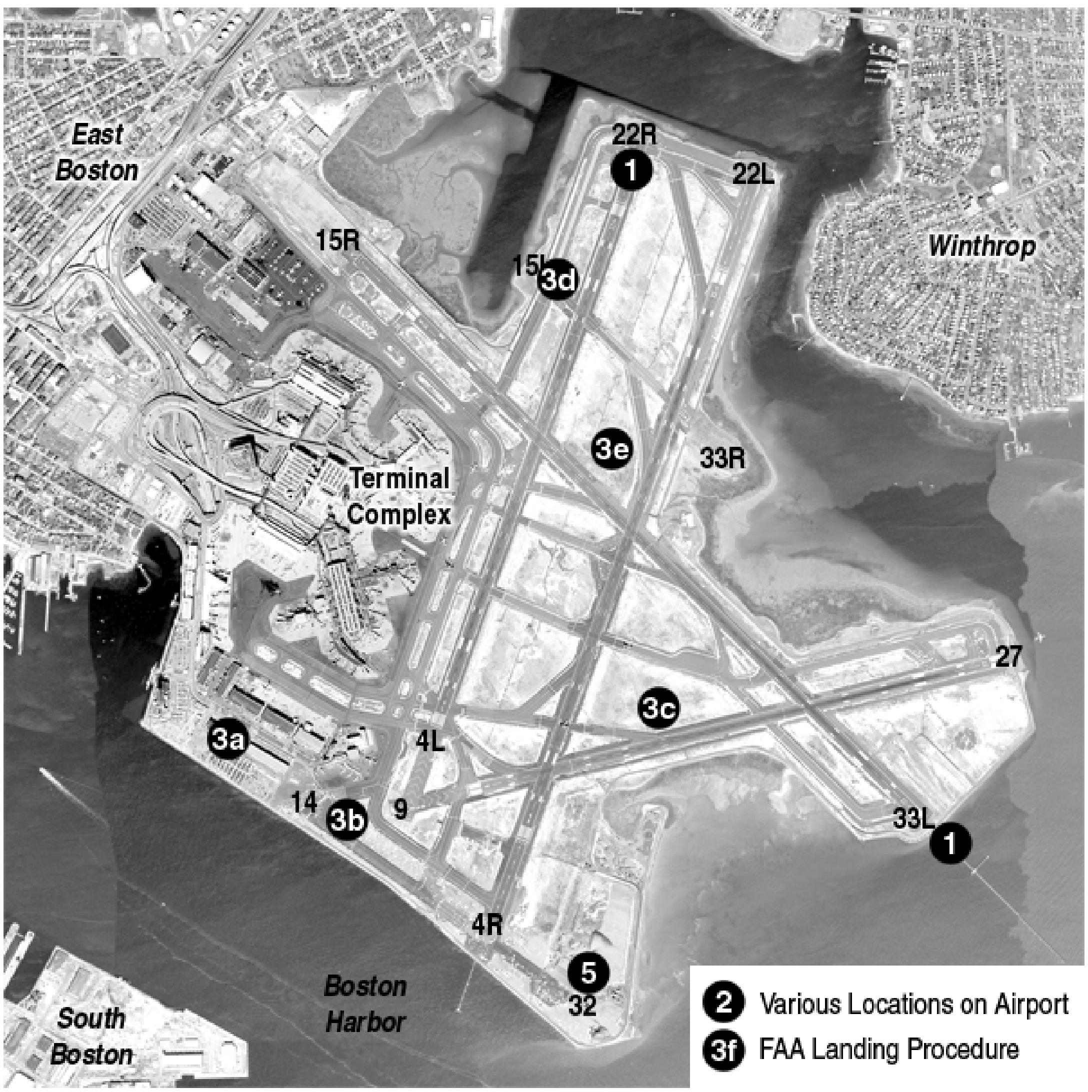
Description	Status
6. Replacement American Airlines Hangar in the NCA This proposal would involve the renovation of portions of the American Airlines Hangar to keep it operational until demolition and reconstruction planning can be completed. Roof, mechanical systems, and restrooms are top priorities for renovation. Ultimately the existing 97,000 square foot American Airlines Hangar would be demolished and replaced with a new hangar that could accommodate Group V aircraft.	Due to the financial impacts of September 11, 2001, planning and design for this proposal has been placed on hold indefinitely. If a decision is made to go ahead with this project, construction would not likely commence until after 2010.
7. Replacement Hangar Facilities in the NCA Construction of new hangar facilities in the NCA would be required to compensate for the loss of hangar facilities that resulted from the CA/T Project, as well as for the projected growth in cargo demand that is forecast to occur in the future.	A preliminary evaluation of this planning concept has been placed on hold. If planning resumes, construction would not likely commence until after 2010.
Tenant Projects/Planning Concepts	
8. Replacement Gas Station Facility in the NCA A new on-airport gas station may be needed to replace the Citgo Station.	Several on-airport parcels in the vicinity of the Citgo Station have been identified as possible locations for the new on-airport gas station. If planning for the facility moves forward, construction would likely commence after 2010.
9. Flight Kitchen Consolidation in the NSA This proposal involves consolidating existing operations, upgrading the NSA roadway infrastructure to improve airside security and access, and constructing landscape edge as a neighborhood buffer.	Due to changes in the flight kitchen industry post-September 11, 2001, expansion of flight kitchen facilities is not anticipated. Initial consolidation of the flight kitchen functions occurred in 2005 with the consolidation of the LSG SkyChef facilities into one building. Further improvements including airside security and access, and landscaping would be done in conjunction with the NSA economy parking lot if it proceeds. A flight kitchen from the SWSA may be relocated to the NSA.
10. New/Replacement GSE Consolidated Facility in the NCA This proposal would provide multi tenant maintenance facilities for GSE.	If the planning for the proposal proceeds, construction would not likely commence until after 2010.
11. NCA Economy Parking Consolidation	See Table 3-7.
12. SWSA Consolidated Car Rental Facility	See Table 3-7.

Note: See Figure 3-3 for the location of service area projects/planning concepts.

Airside Area Projects/Planning Concepts

The airside area includes all Logan Airport land from the edge of the terminal buildings to the Logan Airport harbor boundary, incorporating the Logan Airport apron, runways, gates, and other airfield operating facilities. Airside improvements include upgrades and improvements to the airfield to enhance the operational efficiency and safety of Logan Airport. Table 3-4 describes the status of projects (shown on Figure 3-4) and planning concepts under consideration for Logan Airport's airside area as of December 31, 2006.

Figure 3-4 Location of Projects/Planning Concepts on the Airside



Note: Aerial photo taken February 2006. Runway 14-32 construction completed in November 2006.

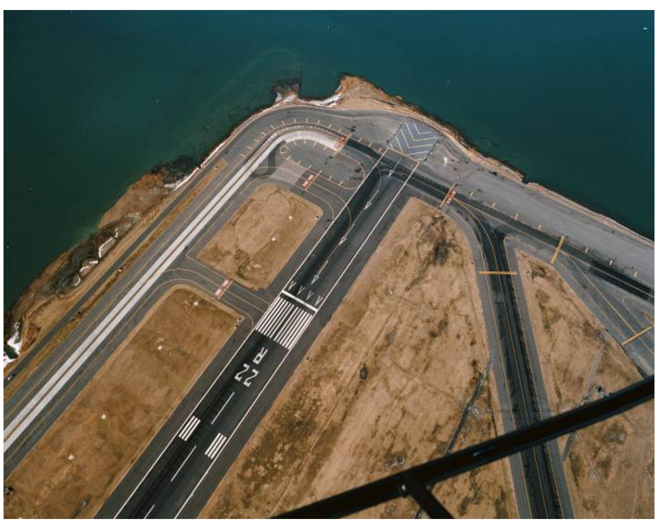
Table 3-4 Description and Status of Projects/Planning Concepts on the Airside (as of December 31, 2006)

Description	Status
1. Runway 22R and 33L Runway Safety Enhancements The FAA requires runway safety areas (RSA) to accommodate aircraft overruns, undershoots and veeroffs in emergency situations. Massport is continuously looking for opportunities to increase the margin of safety for all runways and where practicable providing FAA-standard RSAs at all locations. At Logan Airport, the FAA-standard runway safety area is typically 500-feet wide by 1,000 feet long at each runway end. Where this space is not available, the FAA has recently approved the use of Engineered Materials Arresting System (EMAS) for aircraft overrun protection. EMAS uses a system of collapsible concrete blocks that can stop an aircraft by exerting predictable forces on the landing gear while minimizing aircraft damage. In 2004, the FAA approved installation of a 190-foot section of EMAS at Runway 22R. The FAA also has directed Massport to evaluate opportunities for additional safety enhancements at this location. Massport installed a 158-foot of EMAS at Runway 33L in 2006, in anticipation of full environmental review of additional alternatives. In 2006, Massport initiated an assessment of opportunities to further enhance the existing RSAs at Runway 22R and 33L.	Construction of an EMAS bed at Runway 22R was completed in 2005. An EMAS bed was installed at Runway 33L in 2006. Evaluation of additional safety enhancements for the runway safety areas (RSAs) at both runway ends are now planned to be advanced as a separate project. Massport is preparing an EA in accordance with NEPA and an ENF/EIR in accordance with MEPA. It is anticipated that Massport will file an ENF with MEPA in late 2007 to describe proposed RSA enhancements at both runway ends, followed by a combined MEPA/NEPA filing in 2008. Construction will not commence until the required environmental approvals are obtained. *NOTE*: The proposed RSA enhancements at Runway 33L will replace the RSA improvement that was planned and permitted, but not constructed, for this location as part of EOEA# 5122.
2. Security Wall Installation of a security wall along the perimeter of the air operations area at Logan Airport.	Perimeter wall installation is underway and is expected to be completed by 2008.
3. Logan Airside Improvements Planning Project The project involves construction of a new unidirectional Runway 14-32, Centerfield Taxiway, extension of Taxiway D, realignment of Taxiway N, improvements to the southwest corner taxiway system, relocation of cargo buildings, and reduction in approach minimums on Runways 22L, 27, 15R and 33L. These airfield improvements will reduce current and projected levels of aircraft delay and enhance airfield safety at Logan Airport. The sub-components of this project, as described in the *Airside EIS/EIR,* are presented below along with the associated status.	Construction of Runway 14-32 commenced in 2004 and opened on November 23, 2006. Taxiway improvements were approved in a Record of Decision issued by the FAA in April, 2007. Taxiway improvements construction is planned to commence in September, 2007 and to be completed in 2009.
a. Demolition and relocation of Cargo Buildings 60 and 61.	This component of the project was completed in 2006.
b. Construction of a new unidirectional 5,000-foot Runway 14-32.	Construction began in 2004, and continued through 2005. This component of the project became operational on November 23, 2006.
c. Construction of a 2,000 foot Taxiway D extension, Taxiway D straightening and realignment, and southwest corner taxiway realignment and the installation of all lighting, marking, signage and drainage to support these improvements.	The southwest corner taxiway realignment component of the project commenced in 2007.
d. Straightening and realignment of Taxiway N.	This component of the project is anticipated to commence by 2011.

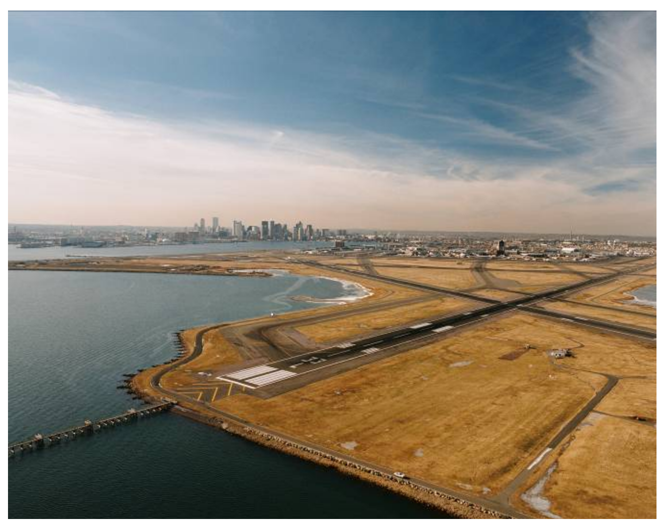
Table 3-4 Description and Status of Projects/Planning Concepts on the Airside (as of December 31, 2006) (Continued)

Description	Status
e. Construction of a 9,300 foot long Centerfield Taxiway that would be located between and parallel to Runway 4L-22R and Runway 4R-22L.	The FAA approved the Centerfield Taxiway in April, 2007. Construction is scheduled to begin in the fall of 2007.
f. Reduction in approach minimums on Runways 22L, 27, 15R, and 33L by FAA.	Reduction in approach minimums on Runway 15R and 33L was addressed in the Airside EIS/EIR. Implementation will be affected by realignment of the Instrument Landing System (ILS) localizer. Construction impacts of relocation of the ILS localizer will be addressed in the forthcoming EA/EIR for the proposed enhancements to the runway safety area at the end of Runway 33L.
4. Governors Island Aircraft Parking Massport is evaluating the feasibility of providing additional aircraft parking at Governors Island for the following: (1) Remain over night (RON) aircraft; (2) Cargo Aircraft; and (3) International aircraft. RON aircraft are generally commercial passenger aircraft that fly into the airport at night and fly out in the morning. Airlines sometimes schedule and position more aircraft than there are gate positions, and therefore remote aircraft parking positions are required. Remote aircraft parking is also appropriate for cargo aircraft that generally arrive in the morning and remain on the ground until their late evening departure. Finally, some international scheduled and charter aircraft that have long turnaround times should be parked remotely when there is a high demand for gates.	Preliminary concepts being evaluated by Massport involve the development of 20 to 50 aircraft positions and ancillary uses. If the concept is deemed feasible and planning continues, it is anticipated that construction would occur no sooner than 2009.

Note: See Figure 3-4 for the location of airside projects/planning concepts.



Runway 22R Runway Safety Area Enhancement Project Area

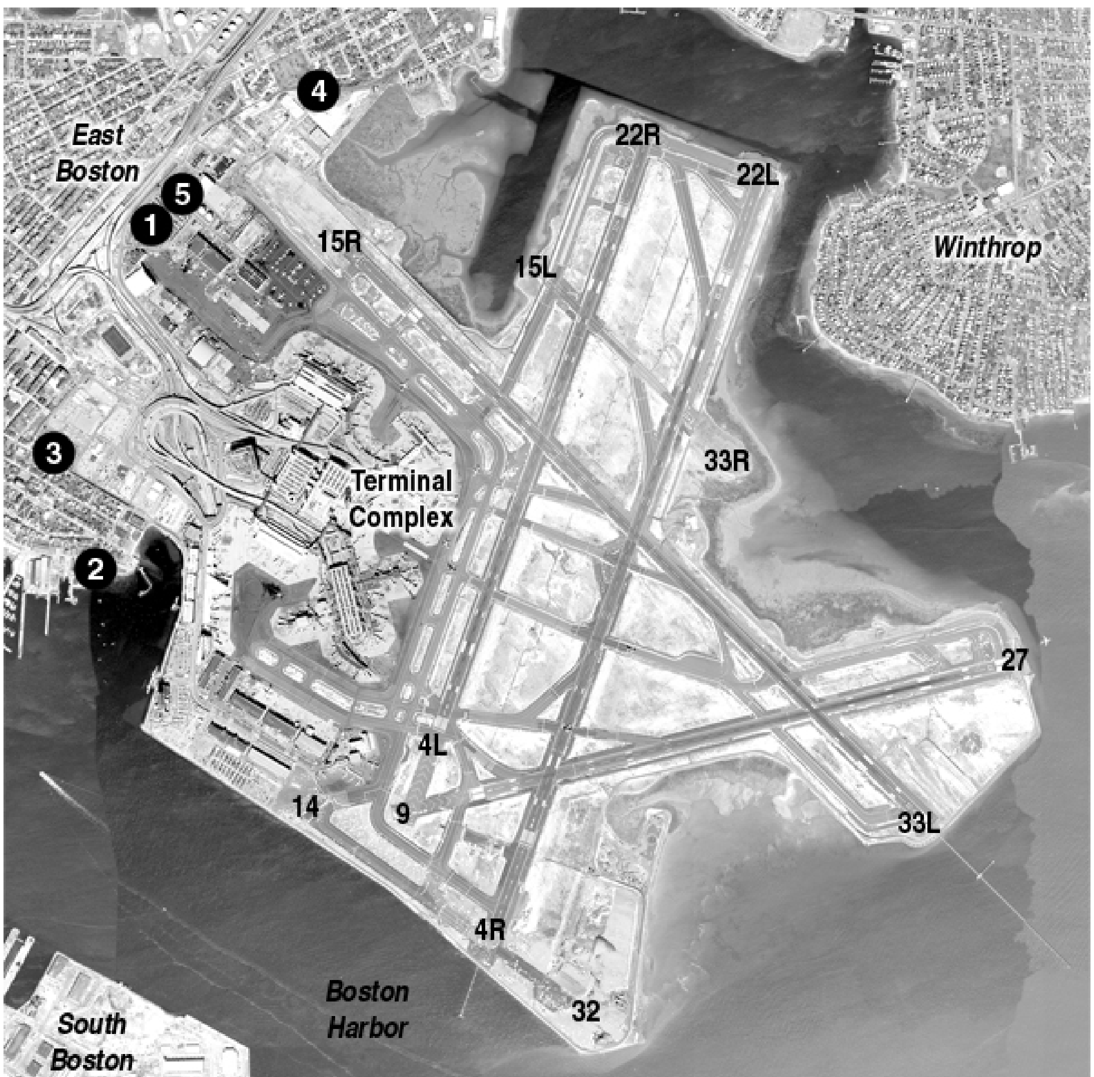


Runway 33L Runway Safety Area Enhancement Project Area

Airport Buffer Projects

Massport has committed up to $15 million for the planning, construction, and maintenance of buffer areas around Logan Airport. Several areas, located generally along the Logan Airport's perimeter boundary, have been identified to provide attractive landscape buffers between airport operations and adjacent East Boston neighborhoods. The buffers are being designed in consultation with Logan Airport's neighbors and other interested parties in an open community planning process. To discuss East Boston open space planning, Massport also participates in meetings with other state, non-profit, and city agencies including MassHighway, the CA/T Project, the Trust for Public Land, the City of Boston's Conservation Commission, the Boston Redevelopment Authority, and the Boston Natural Areas Network. Table 3-5 describes the status of ongoing buffer projects and other buffer projects or planning concepts under consideration as of December 31, 2006. Figure 3-5 shows the location of these buffer projects.

Figure 3-5 Location of Airport Edge Buffer Projects/Planning Concepts



Note: Aerial photo taken February 2006. Runway 14-32 construction completed in November 2006.

Table 3-5 Description and Status of Airport Edge Buffer Projects/Planning Concepts (as of December 31, 2006)

Description	Status
1. SR-2 Roadway Buffer This project involves the construction of a landscaped buffer adjacent to the new SR-2, consisting of a sidewalk and adjacent planting area. The sidewalk will provide a pedestrian link between the MBTA's new Blue Line Airport Station and the terminals at Logan Airport.	Construction of the landscaped buffer adjacent to SR-2 is complete.
2. Navy Fuel Pier Buffer Army Corps of Engineers' (ACOE) remediation of the former Navy Fuel Pier, including backfilling with clean soil, and application of loam and lawn seeds was completed by in 2001. The ACOE completed a Final Remedial Action Closure Report in January 2002. Massport's goal is to beautify the property (0.7 acres) through landscape improvements and to stabilize the waterfront perimeter. The community is interested in the creation of passive open space.	A design team for the Navy Fuel Pier Buffer was selected in late 2004. Design was completed in 2005, reviewed with the East Boston Community, and permit approvals were granted by the Boston Conservation Commission. Construction was completed in December, 2006. However, some additional plantings were completed in the spring of 2007.
3. SWSA Buffer Phase 1 of this project involves the construction of an approximately half-acre linear area with landscaping and lighting improvements along Maverick Street that will include evergreen and deciduous trees, ornamental shrubs, and groundcovers.	Construction of Phase 1 of the SWSA buffer began in 2005 and was completed in the fall of 2006.
Phase 2 involves additional landscape improvements to be implemented in conjunction with the proposed Consolidated Rental Car Facility (if it proceeds).	Phase 2 involves additional landscape improvements to be implemented in conjunction with a proposed Consolidated Rental Car Facility, currently in the concept planning phase.
4. NSA Buffer The NSA Buffer involves landscaped improvements at the airport boundary.	A schematic design was developed during the community planning process. However, this project was suspended at the request of the neighborhood due to concerns about increased public access in this area. When the NSA Economy Parking Lot is completed, a landscaped buffer will be constructed along the MBTA tracks at the edge of the parking area, and a vegetated area will be established between the parking area and Wood Island Marsh.
5. Bremen Street Park The 18-acre Bremen Street Park being constructed by the CA/T Project will be East Boston's second largest neighborhood park. The park will have a variety of facilities, a direct pedestrian connection to MBTA's new Blue Line Airport Station, and a half mile segment of the three mile East Boston Greenway. The park is being built on land that was previously used as off-airport parking (ParkEx).	Construction of Bremen Street Park as part of the CA/T Project commenced in 2004. In August 2004, Massport was designated by the Legislature as the entity to own, operate, and maintain the park upon completion. The CA/T project completed significant portions of the park in early 2007 and a partial opening occurred on June 1, 2007.

Note: See Figure 3-5 for the location of airport edge buffer projects/planning concepts.

Airport-wide Projects

Massport is planning or implementing a number of airport-wide projects/planning concepts as described in Table 3-6.

Table 3-6 Description and Status of Future Airport-wide Projects/Planning Concepts (as of December 31, 2006)

Description	Status
Logan Airport Landscaping Massport prepared a master plan to unify the landscape and open space areas of the roadway and terminal area projects (see below). The design concept is a New England Landscape that will be characterized by informal plantings of birch trees and evergreens. Once completed, the project will include over 15 acres of landscaping.	
a. Terminal Area Roadway Landscape. Approximately 6 acres of land between the roadways and terminal areas would be landscaped. This includes land adjacent to the egress roadway (between the West Garage, Terminal E parking, the Central Cooling and Heating Plant, and the Citgo Station).	One acre of landscaping in the area adjacent to the egress roadway was completed in 2003. The remainder is expected to be completed by the end of 2007.
b. 7D2 Airport Roadway Landscape. Approximately 7.5 acres of landscaping will be provided in the area roughly bounded by Hotel Drive and Harborside Drive (referred to as the "U turn"). This includes 6 acres of lawn being constructed as part of the CA/T Project.	This area was planted initially in 2002. In 2005, Massachusetts Highway Department (MHD) completed the project.
c. 8A Airport Roadway Landscape. This project area encompasses land located approximately between the American Airlines hangar and the Delta reservations building and includes segments of I-90 and Rte 1A.	Approximately 3.5 acres of landscaped area was constructed by the CA/T. Construction was completed in the spring of 2006.
Logan Airport Wayfinding System Provide a comprehensive wayfinding system for Logan Airport facilities including terminals, terminal curbside, parking garages and approach roadways including airport wide signage analysis and planning, development or design guidelines and graphic standards, and a master implementation plan for future projects.	The project design guidelines and graphic standards were completed in early 2006. Program implementation began in 2006 and is expected to be completed by 2010.

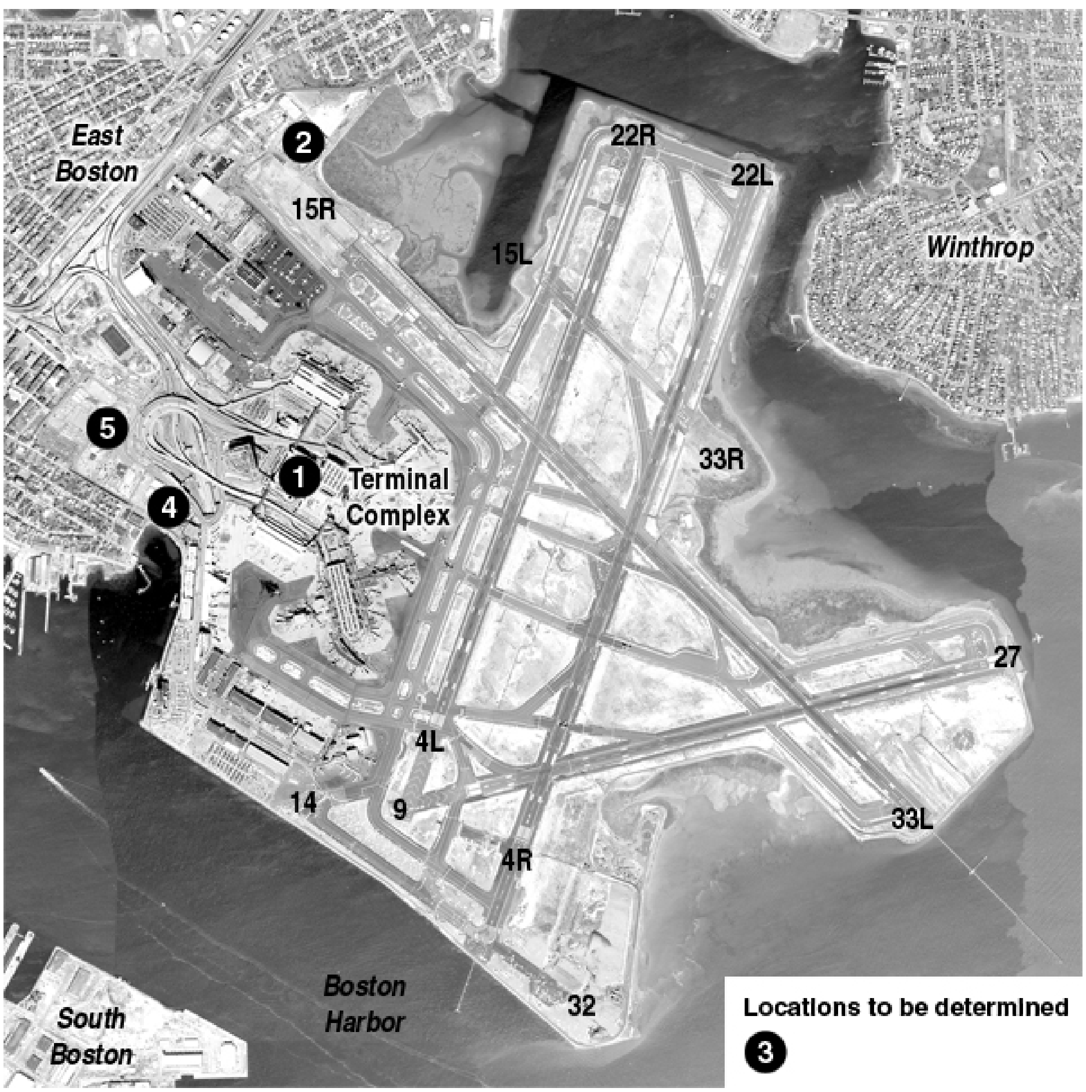
Terminal Area Roadway Landscape

Airport Parking Projects/Planning Concepts

Historically, parking supply at Logan Airport has varied in terms of the specific locations and sizes of individual lots, the mix of parking spaces for air travelers and employee spaces, and the number of spaces in and out of service at any one time primarily due to construction projects being undertaken at Logan Airport. *Chapter 5, Ground Transportation* contains additional information on the historic and existing supply of parking at Logan Airport. The total number of employee and commercial parking spaces permitted at Logan Airport is limited by the Logan Airport Parking Freeze under the State Implementation Plan.

Table 3-7 describes current commercial parking projects at Logan Airport. The location of these projects is shown on Figure 3-6.

Figure 3-6 Location of Commercial Parking Projects/Planning Concepts



Note: Aerial photo taken February 2006. Runway 14-32 construction completed in November 2006.

Table 3-7 Description and Status of Commercial Parking Projects/Planning Concepts (as of December 31, 2006)

Description	Status
1. West Garage Project Phase I comprised the consolidation of 3,150 parking spaces in a new structure between the Central Garage and the Hilton Hotel. The project included elevated pedestrian walkways with moving sidewalks to all terminals. Massport evaluated design options for Phase II of the West Garage and concluded that the most cost effective way to proceed with Phase II was to add three levels of parking with 2,800 parking spaces to the Central Garage. A Notice of Project Change (NPC) was filed with the MEPA Office on October 31, 2000 describing the proposed changes and associated environmental impacts. The Secretary's Certificate on the NPC, issued December 8, 2000, indicated that no further MEPA review is required.	Construction of Phase I commenced in October 1995 and the facility opened September 8, 1998. Construction of Phase II commenced in the spring of 2004 and was completed in early 2007.
2. NSA Economy Parking Consolidation (EOEA#13456) This lot will be located approximately 1,750 feet north of the existing economy lots along Prescott Street. The MBTA Blue Line tracks separate the site from adjacent neighbors. The project involves redevelopment of three parcels, totaling ±15.7 acres, into a combined economy parking facility with the capacity for up to 1,750 vehicles. This project will entail demolishing the LSG Sky Chefs in-flight kitchen building, reusing existing paved parking areas, relocating a Massport equipment storage area; redeveloping the site for economy parking; and encircling the new parking lot with a security fence and an attractive landscape area. The parking areas will include a revenue control gate, landscaping, several transportation center kiosks/ passenger bus shelters, perimeter fencing and lighting designed specifically to minimize neighborhood intrusion. An 8-foot high fence will encircle the site perimeter.	Site preparation (drainage, grading, etc.) commenced in late 2005 and may be completed in 2008.
3. Replacement Parking Facility Temporary parking facilities are being provided to meet parking demands expected due to spaces lost to construction activities, including construction of Central Garage Expansion and Repairs.	The Central Garage expansions and repairs project was completed in early 2007, at which time the temporary parking facilities resulting from the construction activities were no longer needed.
4. Commercial Parking Facilities A commercial parking facility is proposed in the SWSA to meet anticipated parking demand. Use of the facility will be in compliance with the Logan Airport Parking Freeze.	A feasibility study of SWSA redevelopment, to include a proposed Consolidated Rental Car Facility and commercial parking was underway in 2006, and completed in 2007. In March 2007, the Board approved the refinement concept for environmental review and design. This effort is expected to take 18-24 months.
5. Consolidated Rental Car Facility A new consolidated facility for all car rental operations is being evaluated for the SWSA. A consolidated bus system would provide clean fuel buses to serve all rental car patrons.	A feasibility study of SWSA redevelopment, to include a proposed Consolidated Rental Car Facility and commercial parking was underway in 2006, and completed in 2007. In March 2007, the Board approved advancing the refinement concept for environmental review and design. This effort is expected to take 18-24 months.

See Figure 3-6 for the location of commercial parking projects/planning concepts.

4

Regional Transportation Context

Introduction

This chapter reports on the status of the New England regional airports in 2006 and describes Massport's ongoing efforts to support an efficient regional air transportation network. The chapter specifically describes:

- Changes from 2005 in airport passenger and aircraft operations in 2006 for the regional airports, and compares them to Logan Airport activity levels. The primary airports considered for this chapter, in addition to Logan Airport, are: T.F. Green Airport, RI; Manchester-Boston Regional Airport, NH; Bradley International Airport, CT; Burlington Airport, VT; Bangor Airport, ME; Portland International Jetport, ME; Pease International Tradeport, NH; Worcester Regional Airport, MA; Hanscom Field, MA; and Tweed-New Haven Airport, CT.
- Changes in airline service levels and other factors that have contributed to trends in regional airport activity.
- Status of improvement plans and projects at the regional airports.
- Information regarding the recently completed New England Regional Aviation System Plan (NERASP) Study.
- Massport's initiatives and joint efforts with other transportation agencies to improve the efficiency of the New England regional air transportation system.

Key Findings

Highlights for 2006 are:

- Overall, the number of air passengers utilizing New England's primary commercial service airports in 2006 declined marginally, from 48.0 million to 47.9 million. When measured by the number of aircraft operations, however, activity levels fell by 4.4 percent, from 1.4 million operations to 1.3 million operations. This reflects substantial changes in the commercial aviation sector and the continued decline of general aviation (GA) noted in the *2005 Environmental Data Report (2005 EDR)*.

- Major airlines reduced capacity at the regional airports in 2006 as they reconfigured their operations in an effort to consolidate gains made in bankruptcy and near-bankruptcy restructuring. Passenger declines were generally consistent with capacity reductions.
- The average aircraft size of scheduled flights to the regional airports declined in 2006 as airlines substituted regional jet service for mainline jets on certain routes.
- GA operations at New England regional airports declined by 4.2 percent from 2005 levels. Declines in GA activity in New England continue to outpace declines in the rest of the country. According to the Federal Aviation Administration (FAA), GA activity declined by 1.3 percent nationally in 2006, largely due to rising fuel costs.

New England Regional Airport System

As shown in Figure 4-1, the New England region is served by Logan Airport, the primary international hub and domestic destination, and a system of ten regional commercial service airports[1] (regional airports); together, these 11 airports accommodate nearly all of New England's air travel demand. The regional airports range in activity levels from the Bradley International Airport in Connecticut, which served 7.1 million commercial passengers in 2006, to Pease International Tradeport in New Hampshire, which handled approximately 10,500 passengers in 2006.

The regional airports that are closest to and have the greatest influence on passenger traffic and aircraft activity at Logan Airport are T.F. Green Airport in Warwick, RI, Manchester-Boston Regional Airport in NH, and to a very small degree Worcester Regional Airport, in Worcester, MA. While Worcester is not currently served by scheduled air carriers, Manchester-Boston Regional and T.F. Green Airports accommodate some air passenger demand from the Boston market area, and also serve their own market areas. In 2006, T.F. Green and Manchester-Boston Regional Airports served 25.9 percent of the combined passengers at the four airports serving the greater-Boston market area. The regional airports in proximity to the Logan Airport service area accommodated a smaller share of the combined passenger traffic than in 2005, when those airports accounted for 27.1 percent of the Boston-region traffic. Figure 4-2 depicts the historic distribution of air passengers for these three regional airports and Logan Airport.

1 The *New England Regional Airports Air Passenger Service Study* (FAA, 1995) defined the Bradley International, T.F. Green, Manchester, Portland International Jetport, Bangor, Burlington, Worcester Regional and Tweed-New Haven Airports as the region's principal commercial airports, other than Logan Airport, since all of these airports either supported or had previously supported commercial jet passenger services. Subsequently, in 1999, limited commercial passenger service was introduced at Hanscom Field in Bedford, MA and at Pease International Tradeport in Portsmouth, NH. These 11 airports are included in the New England Regional Airport Sytem Plan (NERASP) Study, which was published in 2006.

Figure 4-1 New England Regional Transportation System

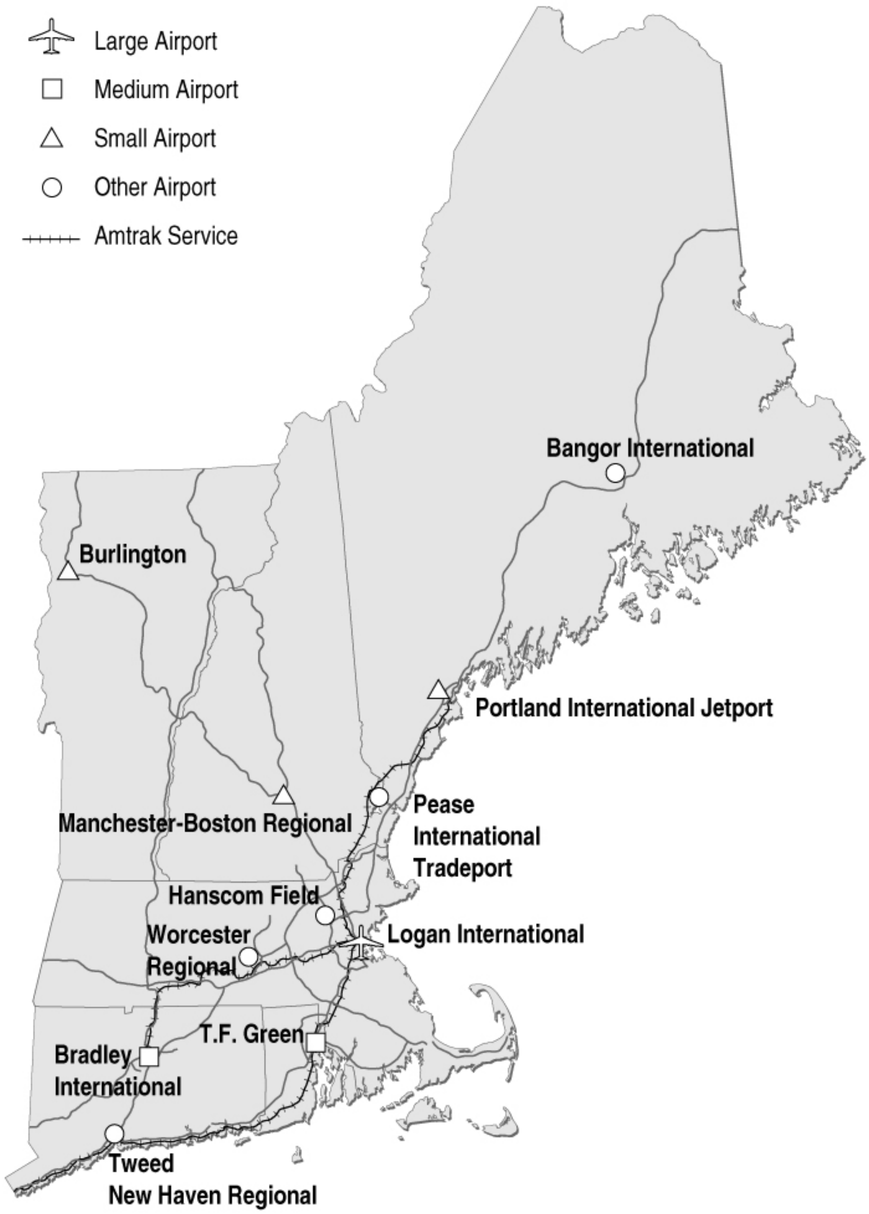
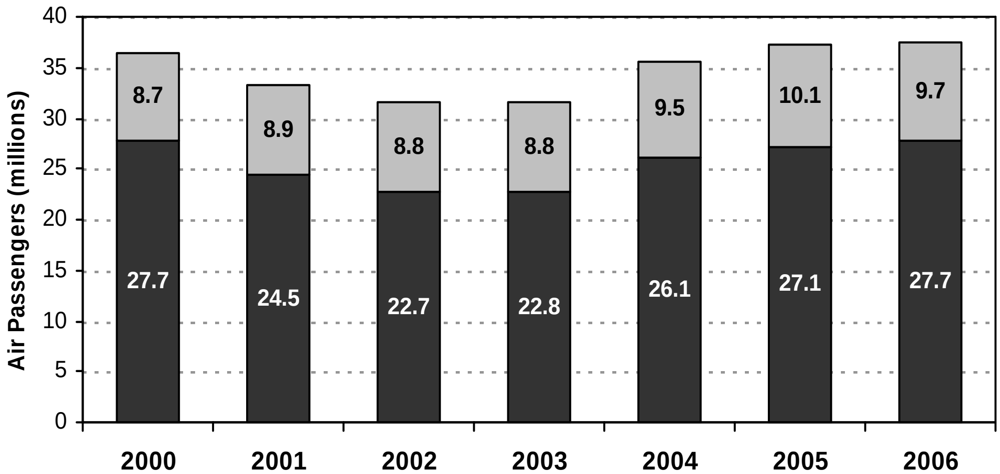


Figure 4-2 Passenger Activity Levels at Logan Airport and Surrounding Airports



Note: Grey shading represents passenger activity at T.F. Green Airport (PVD), Manchester-Boston Regional Airport (MHT), and Worcester Regional Airport (ORH). Black shading represents passenger activity at Logan Airport.

Regional Airport Activity Levels

Passengers

In 2006, total air passenger traffic at New England's 11 primary commercial airports declined for the first time since 2001/2002. The decline was mild – just 0.3 percent – and New England's airports carried approximately 47.9 million passengers compared to 48.0 million passengers in 2005 (refer to Table 4-1). Declining passenger numbers is a reflection of the service trends seen in recent years. Positive passenger growth at Logan Airport countered the regional trend; Logan Airport enplanements rose 2.4 percent for the year. Trends at Logan Airport are discussed in detail in *Chapter 2, Activity Levels*. Figure 4-3 shows the regional airports' share of New England passengers.

As a whole, air passenger traffic in the region declined while the overall United States (U.S.) domestic market grew marginally. Excluding Logan Airport, which experienced 2.4 percent passenger growth in 2006, traffic at the New England airports dropped by 3.7 percent overall in 2006. Changes in scheduled service are discussed below.

Table 4-1 Passenger Activity at New England Regional Airports and Logan Airport

Airport	Passenger Levels (millions)[1] 2000	2001	2002	2003	2004	2005	2006	Percent Change (2005-2006)
Bradley International, CT	7.34	6.89	6.53	6.26	6.74	7.38	7.11	(3.60%)
T.F. Green, RI	5.43	5.53	5.39	5.18	5.51	5.73	5.52	(3.74%)
Manchester-Boston Regional, NH	3.17	3.23	3.36	3.6	3.97	4.33	4.14	(4.50%)
Portland International Jetport, ME	1.34	1.26	1.25	1.25	1.37	1.45	1.36	(6.31%)
Burlington, VT	0.9	1.04	1.1	1.1	1.25	1.37	1.37	(0.07%)
Bangor, ME	0.38	0.37	0.41	0.41	0.45	0.48	0.48	(0.90%)
Tweed-New Haven, CT	0.08	0.06	0.04	0.03	0.08	0.13	0.10	(25.70%)
Pease International Tradeport, NH	0.07	0.06	0.07	0.06	0.05	0.01	0.01	5.48%
Hanscom Field, MA	0.16	0.13	0.07	0.04	0.02	0.02	0.03	31.41%
Worcester Regional, MA[2]	0.11	0.13	0.07	0.00	0.00	0.00	0.03	Not significant
Subtotal	**18.98**	**18.63**	**18.22**	**17.93**	**19.45**	**20.91**	**20.13**	**(3.72%)**
Logan Airport, MA	27.73	24.47	22.70	22.79	26.14	27.09	27.73	2.35%
Total	**46.71**	**43.1**	**40.92**	**40.72**	**45.59**	**48.00**	**47.86**	**(0.30%)**

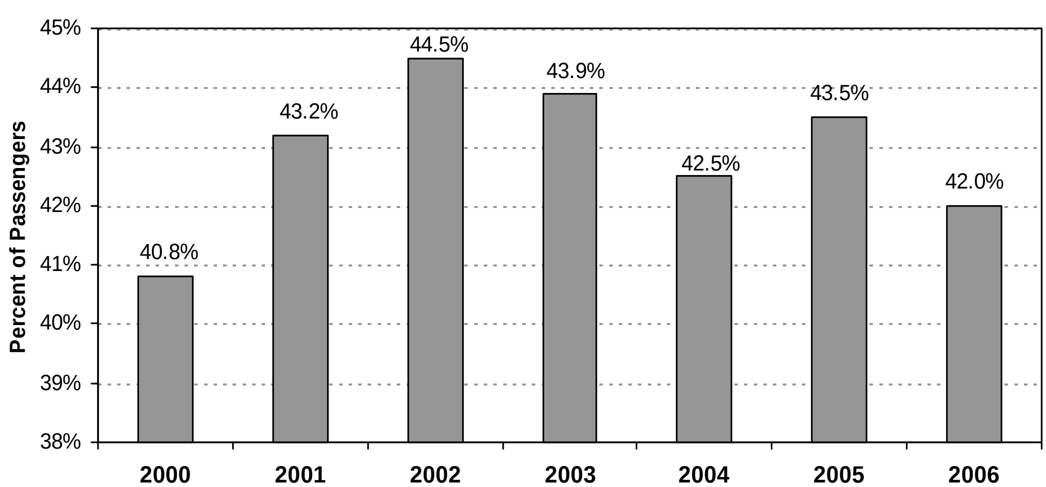
Source: Massport and individual airport data reports.

1 All passengers in millions. Passengers are calculated by adding enplaned plus deplaned passengers (where available) or multiplying enplaned passengers by two. 2003 passenger numbers for Pease International Tradeport have been revised based on statistics from the Pease Development Authority. 2005 statistics are from the NERASP Study, fall 2006.

2 Worcester Regional Airport served fewer than 5,000, but more than 0, passengers each year between 2003 and 2005.

Note: Data for Logan Airport includes international and connecting passengers.

Figure 4-3 Regional Airports' Share of New England Passengers



Aircraft Operations

As shown in Table 4-2, commercial airline operations declined at most of the regional airports. Annual total aircraft operations from 2000 to 2006 are provided in *Appendix F, Regional Transportation Context*.

In 2006, GA and military activity at the combined New England regional airports declined, which is consistent with the declining national trend for GA and military operations. GA includes aircraft operations conducted by air taxi providers, businesses, private pilots, fractional ownership entities, law enforcement, air ambulances, student and recreational pilots, and other aviation users.

Nevertheless, GA operations continue to be the most common activity at the regional airports. Commercial operations now account for 41.2 percent of total operations at the regional airports excluding Logan Airport, down from 41.9 percent in 2005. In 2006, GA accounted for 53.8 percent of total aircraft operations at the regional airports. By comparison, GA represents only 7.7 percent of aircraft activity at Logan Airport, which primarily accommodates the region's domestic and international commercial airline operations.[2]

Overall, the regional airports accommodate a much greater share of the region's aircraft operations than their share of air passengers due to high levels of GA traffic. While 42.1 percent of New England's air passengers enplaned or deplaned at one of the regional airports, these airports accounted for 69.5 percent of the region's aircraft activity. On average, there were approximately 21.8 passengers per aircraft operation at the regional airports compared to 68.3 passengers per operation at Logan Airport.

Service Developments at the Regional Airports

In 2006, scheduled service to the regional airports declined while service to Logan Airport was nearly even with 2005 levels. As a result, Logan Airport's share of scheduled domestic departures increased in 2006 after several consecutive years of declines. Table 4-3 shows the share of scheduled domestic departures for Logan Airport and the ten regional airports in recent years for the peak travel month of August.

The main trend driving changes in air service was a shift from mainline jet service to regional jet and turboprop service at Bradley International Airport and Manchester-Boston Regional Airport. Bradley International Airport's passenger total was 270,000 passengers below its 2005 level, a 3.6 percent decline. (In 2005, there had been a 9.5 percent increase in passenger totals, when compared to the previous year.) Bradley International Airport saw a large shift in the type of service it received from major carriers. Regional/commuter carrier-scheduled flights increased from 15,600 to 18,900, a 21.0 percent increase. (The number of seats operated by those carriers increased by 29.4 percent, indicating that the average aircraft size rose from 2005 to 2006.) Declines in jet carrier-scheduled flights more than offset the increases in regional service, however. In addition, the decline in seats for jet carriers was greater than the decline in flights, indicating the use of smaller jets for mainline flights from Bradley International Airport. Manchester-Boston Regional Airport's jet carrier operations declined in 2006 due to a reduction in Southwest Airlines' service, along with pullbacks by US Airways, Delta Air Lines, and Continental. Some, but not all, of these reductions were softened by increased regional/commuter traffic.

2 There are no military operations at Logan Airport.

Table 4-2 Aircraft Operations by Classification for New England's Airports

Airport	2005 Commercial[1]	2005 General Aviation[2]	2005 Military & Other[2]	2005 Total	2006 Commercial[1]	2006 General Aviation[2]	2006 Military & Other[2]	2006 Total	Share of NE Total
Bradley International	119,048	33,341	3,701	156,090	111,341	34,548	4,348	150,237	**11.29%**
T.F. Green Airport	88,374	28,138	241	116,753	81,282	25,510	229	107,021	**8.04%**
Manchester-Boston Regional Airport	76,115	27,061	477	103,653	68,590	25,507	708	94,805	**7.12%**
Portland International Jetport	42,661	36,191	1,405	80,257	38,663	35,572	1,536	75,771	**5.69%**
Burlington	43,987	49,888	11,468	105,343	41,342	44,471	9,299	95,112	**7.15%**
Bangor[3]	25,976	30,016	24,154	80,146	23,466	29,848	22,359	75,673	**5.69%**
Hanscom Field	3,627	165,424	904	169,955	3,057	167,560	1,433	168,993	**12.70%**
Pease InternationalTradeport[4]	3,197	25,446	7,669	36,312	3,981	25,962	7,797	37,740	**2.84%**
Tweed-New Haven	6,137	60,893	1,063	68,093	5,177	51,702	1,157	58,036	**4.36%**
Worcester Regional	2,727	62,743	519	65,989	3,793	56,770	609	61,172	**4.60%**
Subtotal	**411,849**	**519,141**	**51,601**	**982,591**	**380,692**	**497,450**	**49,475**	**924,560**	**69.48%**
Logan Airport	376,414	32,652	0	409,066	374,675	31,444	0	406,119	**30.52%**
Total	**788,263**	**551,793**	**51,601**	**1,391,657**	**755,367**	**528,894**	**49,475**	**1,330,679**	**100.00%**

Airport	Percent Change (2005-2006) Commercial	General Aviation	Military & Other	Total
Bradley International	(6.47%)	3.62%	17.48%	(3.75%)
T.F. Green Airport	(8.02%)	(9.34%)	(4.98%)	(8.34%)
Manchester-Boston Regional Airport	(9.89%)	(5.74%)	48.43%	(8.54%)
Portland International Jetport	(9.37%)	(1.71%)	9.32%	(5.59%)
Burlington	(6.01%)	(10.86%)	(18.91%)	(9.71%)
Bangor[3]	(9.66%)	(0.56%)	(7.43%)	(5.58%)
Hanscom Field	(15.72%)	1.29%	58.52%	(0.57%)
Pease InternationalTradeport[4]	24.52%	2.03%	1.67%	3.93%
Tweed-New Haven	(15.64%)	(15.09%)	8.84%	(14.77%)
Worcester Regional	39.09%	(9.52%)	17.34%	(7.30%)
Subtotal	**(7.57%)**	**(4.18%)**	**(4.12%)**	**(5.91%)**
Logan Airport	(0.46%)	(3.70%)	0	(0.72%)
Total	**(4.17%)**	**(4.15%)**	**(4.12%)**	**(4.38%)**

Source: Massport, FAA Tower Counts, FAA Terminal Area Forecast, and individual airport records.

1 May include Air Taxi operations by fractional jet operators. FAA Tower counts include some fractional jet operations as "Air Taxi/Commuter" operations.

2 Includes itinerant and local general aviation and military operations at the regional airports. There are no military operations at Logan Airport.

3 Includes international aircraft making a technical stop at Bangor Airport.

4 Pease International Tradeport data for 2005 provided by the Pease Development Authority.

Table 4-3 Share of Scheduled Domestic Departures - Logan Airport and the Ten Regional Airports[1]

	2000	2001	2002	2003	2004	2005	2006
Logan Airport, MA	54.8%	54.6%	50.9%	50.0%	52.4%	49.6%	52.8%
Bradley International, CT; Manchester-Boston Regional Airport, NH; T.F. Green Airport, RI	29.8%	29.2%	32.5%	32.7%	33.9%	35.1%	33.6%
Bangor, ME; Pease International Tradeport, NH; Burlington, VT; Hanscom Field, MA; Tweed-New Haven, CT; Worcester Regional, MA; Portland International Jetport, ME	15.4%	16.2%	16.6%	17.2%	13.7%	15.3%	13.6%

Source: The Official Airline Guide.
1 For the peak travel month of August.

The regional service airports are increasingly served from points outside New England. Figure 4-4 shows that the share of New England-originating flights that also end in New England, at any airport, has been declining steadily since 1985. This trend reduces pressure on Logan Airport and the other large New England airports and results in more convenient routings and reflects a decreased reliance on Logan Airport as a primary connecting point for regional/commuter flights from surrounding New England airports.

Details of scheduled passenger operations by market and carrier for the regional airports are presented in *Appendix F, Regional Transportation Context*.

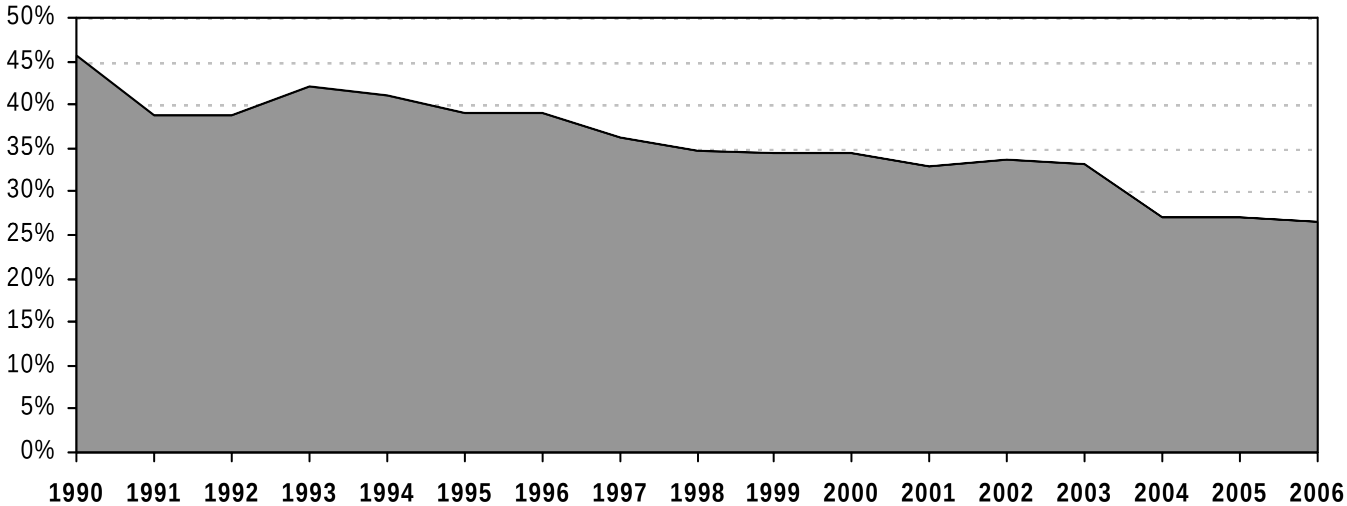
Service Developments at Other New England Airports

In addition to Logan Airport and the regional airports discussed thus far, a third tier of airports serves isolated communities or provides niche-commercial airline services in New England.

These airports include Augusta, Presque Isle, Bar Harbor, and Rockland, in Maine; Hyannis, New Bedford, Martha's Vineyard, and Nantucket, in Massachusetts; and Westerly, RI. The third-tier airports support frequent commercial service to Logan Airport and, in some instances, T.F. Green Airport, during the summer and at lower frequency during the winter. Hanscom Field and Pease International Tradeport were not served regularly by commercial passenger airlines until both airports received limited niche-market services in 1999.

Most of these third-tier airports are not in close proximity to Logan Airport or are isolated due to geographic factors. Because of their remoteness and/or limited market areas, these airports are unlikely to attract passengers that now use Logan Airport. Of all these airports, Hanscom Field is the most relevant since it lies within the Greater Boston Metropolitan market served by Logan Airport and it is operated by Massport. Pease International Tradeport is also noteworthy both because of its proximity to Boston and its airport facilities. The location of Hanscom Field and Pease International Tradeport airports are shown in Figure 4-1.

Figure 4-4 Share of New England-Originating Flights with New England Destinations



Source: Official Airline Guide. (August for each year.)

Hanscom Field

Hanscom Field, which Massport owns and operates, continues to play an important role in the regional transportation system as the region's premiere facility for business/corporate GA and as a GA reliever to Logan Airport. Hanscom Field accommodates a variety of GA operations that might otherwise use Logan Airport. In addition to its role as a GA reliever to Logan Airport, Hanscom Field accommodates niche commercial airline services.

In 2006, there were 168,993 aircraft operations at Hanscom Field. Aircraft activity at Hanscom Field fell by 0.6 percent compared to 2005. GA operations accounted for the vast majority (99.2 percent) of Hanscom Field activity, with 169,560 operations in 2006, or over five times the number of GA operations that occurred at Logan Airport. In 2006, Hanscom Field accommodated 3,057 commercial airline operations. Commercial flights at Hanscom Field are primarily operated by regional airlines using turboprop aircraft.

Pease International Tradeport

In 2006, there were 37,740 aircraft operations at the Pease International Tradeport, an increase of 3.9 percent from 2005. Passenger volume continued to decline; the total number of passengers dropped from approximately 54,000 in 2004 to 13,000 in 2005 (including both scheduled and charter passengers), and fell further to 10,500 in 2006. Pan Am/Clipper Connection and Allegiant Airways served Pease International Tradeport in 2006. Allegiant Airways began scheduled service to Orlando-Sanford in November 2005 and continued that service throughout 2006. Pan Am/Clipper Connection ended service on several routes.

Regional Airport Improvement Plans

The following section describes significant airport improvements that are planned or under construction at the regional airports.

T.F. Green Airport

Planning for an airport-wide improvement program at T.F. Green Airport in Warwick, RI, including the extension of Runway 5-23, is currently underway. Work on the Draft Environmental Impact Statement (EIS) for the T.F. Green Airport Improvement Program, which began in February 2005, continues. Extending the runway will enable the airport to accommodate demand for long-range non-stop flights to the West Coast. Anticipated safety projects include resurfacing Runway 16-34, improving the safety areas at its runway ends, and demolishing Hangar 1 due to an air space penetration. Other improvements include terminal and concourse expansion, and parking and roadway improvements. Because of potential environmental impacts associated with wetlands and community disruption, the FAA determined the need to prepare an EIS for many of the proposed improvements.

One project currently under construction is the Rhode Island Department of Transportation's (RIDOT) $226 million intermodal transportation hub near T.F. Green Airport. The facility will include a commuter rail station served by Massachusetts Bay Transportation Authority (MBTA), a new consolidated rental car facility, a bus station for both local Providence-area buses and intercity buses, and commercial parking. The station will be directly connected to the airport terminal by an elevated skywalk.

Manchester-Boston Regional Airport

Over the past decade, over $500 million was invested in Manchester-Boston Regional Airport to improve and develop landside and airside facilities and infrastructure. Projects included a 158,000 square foot passenger terminal and two 75,000 square foot terminal additions, a 4,800 space parking garage with an elevated pedestrian walkway connection to the terminal, roadway improvements, and extensive runway reconstruction and lengthening.

To date, the airport has completed the majority of the short-term, mid-term and long-term projects contained in its 1997 Master Plan Update. Improvements to be completed over the next several years include:

- Reconstruction of Runway 06 and safety area improvements
- Rehabilitation of Runway 17-35
- Construction of a glycol collection/treatment facility
- Construction of a three-gate North End Terminal Expansion
- Construction of Parking Lot
- Expansion of Parking Lot C

Manchester-Boston Regional Airport functions as an alternate airport serving the Boston-area market. In an effort to attract more Boston-area passengers, the airport is offering a free bus for ticketed passengers from the Sullivan Square MBTA station in Boston, with a stop at the Anderson Regional Transportation Center in Woburn, MA. Trial service began in November 2006. The shuttle is scheduled to run every two hours, 24 hours a day.

Bradley International Airport

Work was completed on the Master Plan Update at Bradley International Airport during 2004. The Master Plan Update was originally initiated in 2000 and was revised after September 11, 2001 to incorporate anticipated industry-wide developments and the future aviation and security requirements at the airport.

Work on the specific projects discussed in the Master Plan Update began in 2005. The refurbished and expanded Terminal A has opened; the project added a concourse and 12 new gates. Further construction projects include raising the roof of the existing terminal and installing new baggage screening machines to allow 100 percent screening.

The NERASP Study (which is discussed later in this chapter) cited the following as potential future capital improvements for Bradley International Airport:

- Rehabilitation of Taxiways E and T
- Installation of Runway 33 Precision Approach Path Indicator
- Purchase of noise monitoring equipment and implementation of noise abatement plan

Hanscom Field

Massport has planned several landside and airside improvements at Hanscom Field, which are described in detail in the *Hanscom 2005 Environmental Status and Planning Report* and the annual *State of Hanscom* report. On the landside, the planned improvements include the redevelopment of Hangars 10 and 24 and the expansion of the field maintenance garage. Airside improvements include enhancements of runway safety areas, taxiway rehabilitation, ongoing approach and departure surface vegetation management, and paving the perimeter surface road. Renovations of the first and second floors of the Civil Air Terminal are also planned.

Some longer-term potential improvements, which are expected but have not been formally planned and may change in response to market conditions, include the construction of new GA hangars and cargo facilities and additional parking.

Worcester Regional Airport

Worcester Regional Airport has developed a master plan based on the medium growth scenario in the NERASP Study. Long-term objectives under the 2006 Master Plan Update include updating the airport's ground access infrastructure and parking and adopting more advanced NAVAIDS technology. Near-term actions include roadway access improvements, runway improvements, planning for a CAT III Instrument Landing System, and security enhancements.

Initiatives in Support of Regional Alternatives

Massport advocates a regional transportation policy to improve the efficient use of the region's transportation infrastructure by appropriate expanded use of regional airports and alternative transportation modes. To achieve this policy goal, Massport is committed to cooperative transportation planning and is working actively with a broad array of transportation agencies and concerned parties to promote an integrated, multi-modal regional transportation network. Massport has undertaken several initiatives to advance a strong network of commercial service airports in the New England region.

Massport also participates in several interagency transportation planning forums pertaining to alternative, inter-city travel modes. Previous filings described past initiatives and cooperative planning ventures. The following section describes Massport's most recent initiatives.

Massport's Cooperative Planning Efforts

A better balanced regional intermodal transportation network would reduce reliance on Logan Airport as the region's primary transportation hub, and provide New England travelers with a greater range of viable transportation options. Regional airports have emerged as economic and transportation centers within the communities that they serve. If this role were enhanced, this would reduce the dependence on intraregional automobile trips and on Logan Airport itself as the beginning, destination, or connecting point for air passengers.

As a result of the 1999 Regional Transportation Summit, Massachusetts and other New England states developed agreements to expand and improve regional transportation between the states by increasing rail services and evaluating transportation needs and impacts. In December 2000, a second annual Summit was held to discuss regional transportation issues and infrastructure development, use, and efficiency. An outcome of this summit included the proposal to re-establish the New England Governors Conference Committee on Transportation as a regular forum for further discussion of regional transportation initiatives.

The Council of New England Governors and other policy decision makers throughout the region will be able to utilize strategies and information developed in the NERASP Study, a regional aviation system study completed by the FAA, Massport, New England state aviation directors and regional airport directors, as a framework for integrated regional aviation policy and planning. The NERASP Study is discussed in the next section.

In March 2001, the New England Governors adopted a resolution to coordinate and implement regional transportation planning across the six New England states. The formal resolution created the Regional Transportation Coordinating Council (RTCC) to work with the FAA to study and increase regional airport use. The RTCC meets quarterly and consists of twelve members, with each governor appointing two members. The mission of the RTCC is to encourage federal transportation agencies to participate in the planning and funding of regional initiatives aimed at building and enhancing regional transportation infrastructure. RTCC efforts have been folded into the NERASP Study.

New England Regional Aviation System Plan (NERASP) Study

In 1995, the New England Council, Massport, the FAA, and the six New England states conducted the New England Regional Airports Air Passenger Service Study. This Study was the first of its kind to assess air

service development from a regional perspective. The Study analyzed air passenger demand in the regional airport market areas and determined that a substantial number of air passengers with ground origins or destinations convenient to the regional airports were using Logan Airport instead. The Study concluded that expanded services, particularly jet service to major airline connecting hubs and high-density local markets, and competitive air fares would enhance the ability of the regional airports to recapture the passengers that they were losing to Logan Airport. The subsequent entry of Southwest Airlines to T.F. Green Airport and Manchester-Boston Regional Airport, and the corresponding surge in passenger traffic, demonstrated the validity of that conclusion.

On April 14, 2000, Massport, the FAA, and the regional airport directors agreed to undertake a follow-up study, the NERASP Study. Massport was the contract administrator for this FAA study, with Massport contributing 5 percent of the study funds.

The overall objective of the NERASP Study was to identify strategies for optimizing New England's regional airport system. The Study was conducted in two phases. Phase I of the Study began in 2002 and was completed in 2004. Phase 2 began in 2005 and the NERASP Study final report was released in October, 2006.

The major forecast tasks of the NERASP Study included the following:

- Regional passenger forecasts for 2010 and 2020
- Updated passenger and operations forecasts for individual study airports
- Analysis of airport usage patterns and factors influencing airport choice by New England air passengers
- Identification of new air service opportunities for each study airport

The NERASP Study determined that airport proximity is the principal factor that passengers consider when selecting an airport if multiple airports are convenient to the passenger. However, passengers do actively choose airports that may be farther away from their ground origin or destination if those airports offer better air services or lower airfares.

The Study identified and documented that there is a high degree of cross-airport utilization within the Greater Boston airport system (i.e., Logan, T.F. Green, and Manchester-Boston Airports). While over 40 percent of New England air passengers have a ground origin or destination that is closer to Logan Airport than any other airport, a significant number of these passengers choose to use the T.F. Green Airport and Manchester-Boston Regional Airport. For example, in 2004, 18 percent of the passengers who used T.F. Green Airport had a ground origin or destination that was closer to Logan Airport than to T.F. Green Airport. Similarly, 23 percent of the passengers who used Manchester-Boston Regional Airport had a ground origin or destination that was closer to Logan Airport than to Manchester-Boston Regional Airport.

The Study also documented that passengers who are closer to T.F. Green Airport or Manchester-Boston Regional Airport may choose to use Logan Airport when traveling to destinations where Logan Airport offers better air service, such as non-stop flights to international or transcontinental destinations, or lower airfares. For the same period, the Study estimated that 34 percent of passengers for whom T.F. Green Airport was the closest airport actually choose to fly to/from Logan Airport. For Manchester-Boston Regional Airport, the share of Manchester-area passengers choosing to fly to/from Logan Airport was 46 percent. In effect, the three airports

act as a system of airports, with significant numbers of passengers choosing the most convenient airport in terms of access, airfares, and available air services depending on their individual air travel needs.

In the Base Case growth scenario, the NERASP Study projects New England's scheduled commercial airline passenger demand (residents and visitors, enplaning plus deplaning) to increase by 3.5 percent per year from 43 million in Fiscal Year 2004 to 76 million in Calendar Year 2020. Of the region's largest airports, Manchester-Boston Regional Airport is forecasted to be the fastest growing, with air passengers increasing by 3.9 percent annually. Scheduled commercial airline passengers at Logan Airport are forecast to grow at an average annual rate of 3.4 percent reaching 42.8 million by 2020. The NERASP Study documentation, including forecast details, survey methodology and the final report, can be found at www.nerasp.com/documentation.htm.

Regional Rail Transportation Initiatives

This section reports on the Downeaster and Northeast Corridor rail services, and the Pilgrim Partnership. The Downeaster rail service operates along a 115-mile corridor between Boston-North Station and Portland, Maine. The service is operated by Amtrak under contract to the Northern New England Passenger Rail Authority (NNEPRA). The Downeaster currently makes four daily round trips between Portland and Boston, with a one-way trip time of 2.5 hours. The Downeaster currently serves a total of ten passenger stations, including Boston-North Station, Anderson Transportation Center (Woburn) and Haverhill in Massachusetts; Exeter, Durham, and Dover in New Hampshire; and Wells, Saco, Old Orchard Beach (seasonal service) and Portland in Maine. Funding for the capital and operating needs of the service is provided by the State of Maine through NNEPRA. There are five scheduled round trips, of which one is currently operated by bus (although train service is expected to resume). An estimated 360,000 one-way trips were taken on the Downeaster in Fiscal Year 2006, the most since service began in 2001 and an increase of 23 percent over the 294,000 one-way trips taken in 2005. As of February 2007, average revenue per passenger was $13. Many passengers travel on passes, which results in a reduced average fare.

Amtrak's Northeast Corridor is an intercity rail service that operates between Boston-South Station and Washington, DC via New York City. Other major destinations served by the route include Providence, RI; New Haven, CT; New York, NY; Philadelphia, PA; and Baltimore, MD. The Northeast Corridor is the mostly heavily used intercity rail corridor, and offers the highest level of service, in the U.S. Amtrak operates two distinct services between Boston and Washington, DC along the corridor: the Acela Express, its high-speed limited-stop service that was inaugurated in the year 2000; and the Acela Regional, a lower-speed service that makes local stops along the route. Travel times on the Acela Express range from 3.5 hours from Boston to New York to just over 6.5 hours from Boston to Washington, DC. Travel times on the Acela Regional range from about 4 ¼ hours from Boston to New York to approximately 7 ¾ hours from Boston to Washington, DC. A total of 18 daily departures are offered between South Station and Penn Station in New York, of which about half are Acela Express. Most of these trips continue south to Washington, DC and a smaller number continue further south to Newport News, Virginia. System-wide Amtrak ridership was 24.3 million one-way trips in fiscal year 2006. The Northeast Corridor represented 39 percent of total annual Amtrak ridership, or about 9.4 million passenger trips. Boston was the 8th busiest station in the Amtrak system in Fiscal Year 2005 (October 2004 to September 2005), with 971,000 passengers. (Data for Fiscal Year 2006 are not yet available on the station level.) Amtrak captures approximately 35 percent of the total air/rail market between Boston and New York, up from 18 percent before Acela service was introduced.[3]

3 Air/Rail Statistics; Amtrak Market Research and Pricing; October 26, 2006.

The Pilgrim Partnership is an arrangement between the MBTA and RIDOT under which RIDOT allocates some of its federal funding to the MBTA in return for commuter rail service to Boston from Rhode Island. MBTA Commuter Rail currently reaches Providence, and plans are in place for service to Pawtucket, Wickford, South County, and T.F. Green Airport in Warwick, RI. Commuter Rail service could potentially attract more passengers from the Boston area to T.F. Green Airport.

Other Cooperative Regional Transportation Planning and Operation Efforts

Massport participates in the following regional transportation planning efforts:

- Massport participates in Fly New England, a cooperative marketing association that advocates the use of New England's regional airports. Fly New England participating airports include Burlington, Portland, Bradley International, Manchester-Boston Regional, T.F. Green, Logan, and Worcester Regional Airports.
- Massport supports inter-city rail planning through its membership in the Boston Metropolitan Planning Organization (MPO). The MPO is a cooperative planning board that consists of these state and regional agencies: Executive Office of Transportation, MassHighway, Metropolitan Area Planning Council, MBTA, and the MBTA Advisory Board. Several municipal governments also participate in the MPO process, including the cities of Boston, Everett, Newton, and Salem, and the towns of Bedford, Hopkinton, and Framingham.
- Massport periodically participates in meetings of other regional and state aviation organizations and the Massachusetts Aeronautics Commissions.

Massport also cooperates with other transportation agencies to promote transit operations. Information on Massport's cooperation with other transportation agencies in relation to transportation planning and operations is provided in *Chapter 5, Ground Transportation*. Chapter 5 also provides information on transit ridership, including ridership to Logan Airport on the Silver Line which is Boston's first Bus Rapid Transit line, and the status of ground transportation improvements at, and in the vicinity of, Logan Airport.

5

Ground Transportation

Introduction

Massport's ground transportation goal is to provide a diverse range of ground access options for air passengers, airport employees, and other airport users. This is accomplished by promoting ridership on high occupancy vehicles (HOVs), reducing reliance on single occupant vehicles (SOVs), and maintaining and enhancing efficient transportation access and parking options in and around Logan Airport. Since the early 1980s, Massport has been a leader in the development, promotion, and use of alternative means of ground transportation for access to and from Logan Airport. By providing a diverse range of environmentally responsible alternatives to travelers, employees and other Airport users, reliance on SOV use has diminished, reducing traffic congestion and improving air quality.

Over recent years, extensive roadway improvements have been implemented at the Airport in conjunction with the Central Artery/Tunnel (CA/T) and Logan Airport modernization projects. The Service Road between Airport Station and Porter Street was completed in 2006, leaving Massport's Central Garage addition (completed in early 2007) as the only major landside construction project at the Airport underway in 2006. Figure 5-1 presents the roadway infrastructure at Logan Airport in 2006.

This chapter discusses existing ground transportation options, ridership levels, parking, and traffic conditions at Logan Airport during 2006. An historical comparison of ridership levels is provided from 1990 through 2006 for informational purposes. As noted in the *2005 Environmental Data Report* (*2005 EDR*), due to the completion of major Airport construction projects and the Airport roadway network, the 2005 reconfiguration brought a new benchmark from which to measure ground transportation accomplishments. Comparisons to prior years cannot be made directly. In 2006, with the closing of I-90 access to the Airport for tunnel collapse repairs, traffic volume data collection was suspended and ridership levels on other transportation modes saw interim increases that may be related to the closure. Therefore, the *2007 EDR* will mark the first year Massport can measure the success of the Logan Airport modernization projects against the new 2005 benchmark. The following sections focus on progress in 2006 of:

- Ground access modes, services, and ridership for air passengers, visitors and employees
- Transportation demand management measures implemented by the Logan Transportation Management Association (Logan TMA)
- Parking supply, demand, duration, and cost
- Ground access planning and management

Key Findings

Ground transportation and access highlights for 2006 include:

- Ground transportation activity levels increased across the board from 2005 to 2006 as a result of a 2.4 percent increase in the number of air passengers, as described in *Chapter 2, Activity Levels*.
- A portion of I-90 connecting the City of Boston and areas to the south and west of Boston to Logan Airport was closed from July 2006 until early 2007, which is believed to have reduced traffic flows to and from the Airport.
- Ridership on the Massachusetts Bay Transportation Authority (MBTA), Logan Express, water transportation, scheduled and unscheduled HOV Services, and taxis increased in 2006. This is due in part to the completion of roadway and other construction projects at the Airport, and to the closure of the I-90 connector to the Airport for much of 2006.
- Installation of the MBTA's automatic fare collection Charlie Card machines in all Logan Airport Terminals was completed in November 2006.
- In 2006, additional early morning transportation between New Hampshire and Logan Airport began, with Massport-subsidized service provided by the C & J Bus Company.
- The number of on-Airport parkers decreased by 8.4 percent in 2006.

2006 Ridership and Trends

Ground Access Modes

Passengers and employees access Logan Airport via an array of HOV transportation modes, including the following:

- Public transit (MBTA rapid transit, Silver Line Bus Rapid Transit (BRT) line, bus, and water transportation)
- Logan Express bus service
- Scheduled buses and vans (including Logan Direct)
- Unscheduled private limousines and vans

Additional ground access to Logan Airport is provided by modes that are categorized as non-HOV, as follows:

- Private automobile
- Taxicab
- Rental car

The following sections provide an overview of public transportation services available to Logan Airport patrons with current ridership levels and historic trends. Figure 5-2 illustrates the public transportation access options for travel to and from Logan Airport.

Figure 5-1 Logan International Airport 2006 Roadway Network

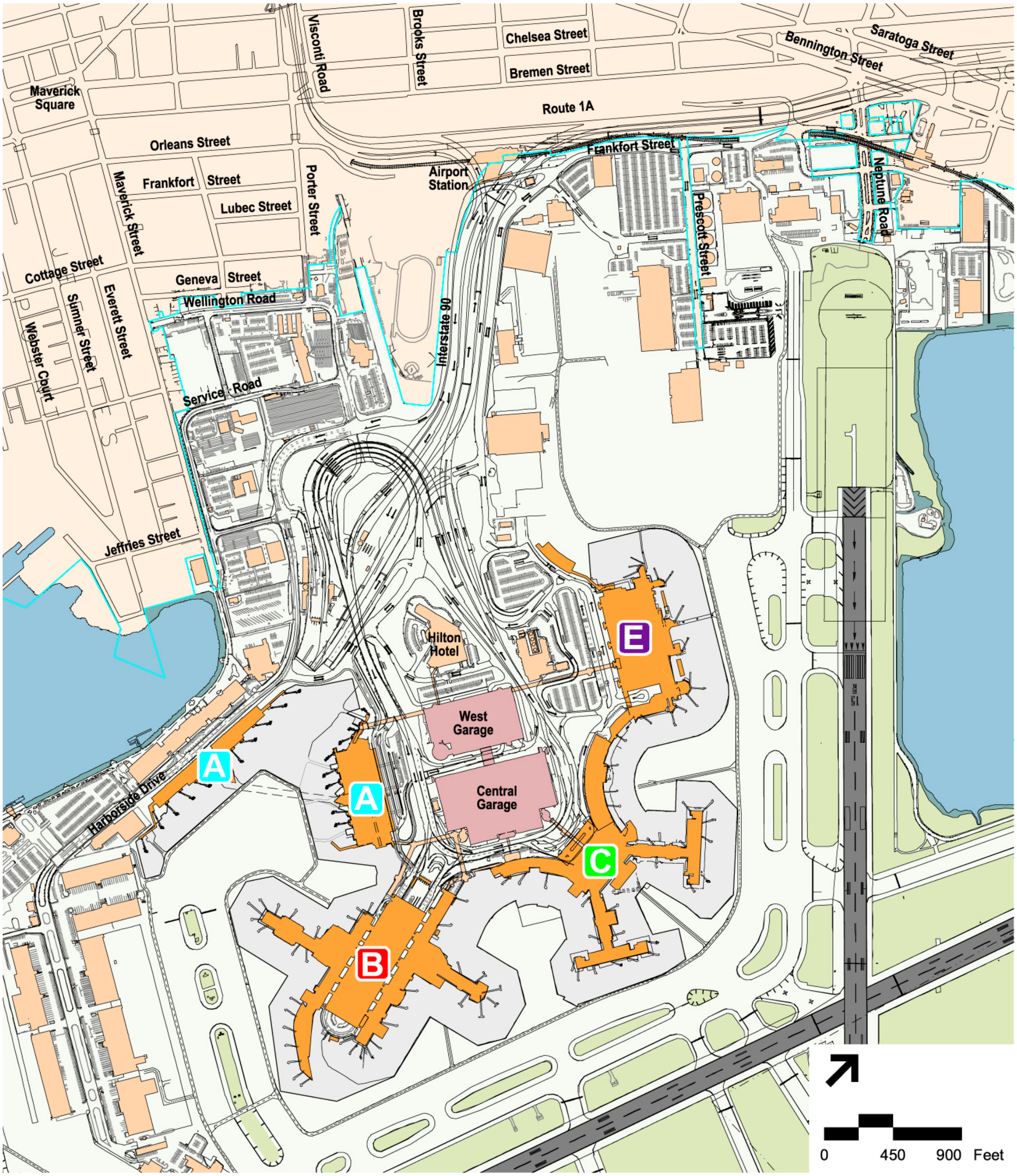
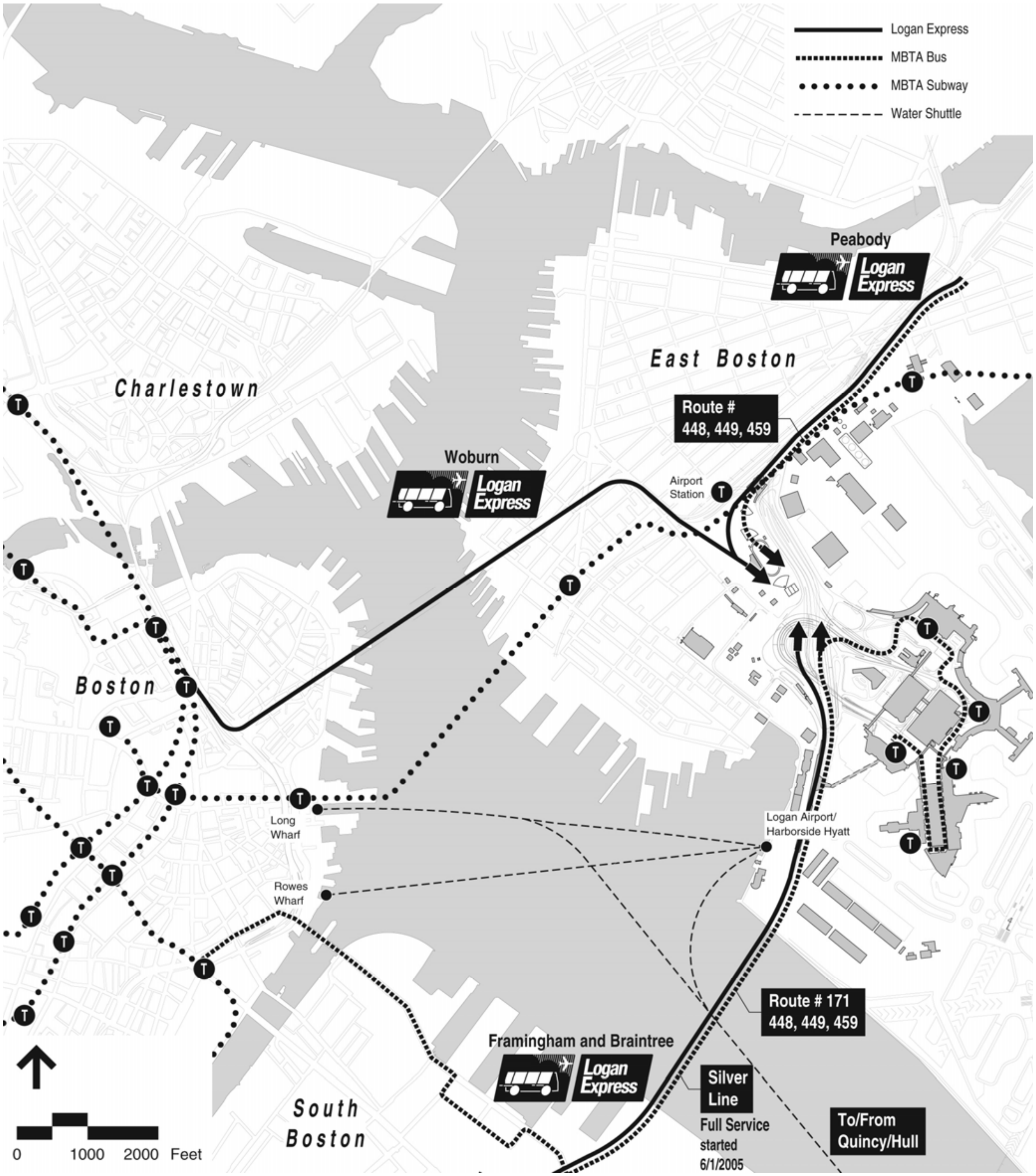


Figure 5-2 Logan Airport - Public Transportation Options



Ground Access Services

Massport continues to promote and support public and private HOV services aimed at serving air passengers, Airport users and employees. While private automobiles, taxis, and rental cars often carry multiple occupants, they are not categorized as HOV modes.

For 2006, available ridership data and an update on the status of each HOV and non-HOV mode are provided below. Ridership levels for Logan Airport public transportation modes are summarized in Table 5-1. As shown, changes in ridership from 2005 to 2006 have increased among all modes. This is due in part to the completion of major construction at the Airport and enhancements made to support alternate transportation. Some of the increases in 2006 can also be attributed to the closure of I-90[1] near the Airport between July 11, 2006 and January 2007 (sections were opened over several days beginning in December 2006).

Determination of Logan Airport's mode share the percent of air passengers using a particular mode to access Logan Airport is based on the results of periodic passenger surveys. While the ridership data presented in this chapter provide a status report on 2006 conditions, they cannot be used to determine mode shares for individual modes or for passengers or employees separately because the data do not discern between passengers or employees. Moreover, non-Airport patrons, such as East Boston residents and car rental patrons are included in the ridership data. A recent employee survey was conducted in 2001 and reported in the *2001 EDR*. A recent air passenger survey, conducted in 2004, revealed a 30.3 percent HOV mode share when Logan Airport served 22.8 million air passengers. A new passenger survey was completed during the spring of 2007 and will be reported in the *2007 EDR*. A new employee survey was completed in the winter/spring of 2007 and will also be reported in the *2007 EDR*.

Rapid Transit

The MBTA provides direct connections to Logan Airport via the Blue Line at the new Airport Station and via the Silver Line to each of the terminals. Since 1990, the MBTA Blue Line ridership has not changed significantly, varying between 2,500,000 and 3,100,000 annual riders. This relatively stable ridership trend in light of the increased air passenger activity over the years is partially attributable to increased use of other public transportation modes such as the Logan Express bus service, the Silver Line, and scheduled vans, buses, and limousines. Ridership for the Silver and Blue Lines is discussed in more detail below.

Silver Line Ridership

The Silver Line is the most recent addition to the City's transit system and is Boston's first BRT line. One section of the Silver Line travels through a tunnel between South Station and the South Boston waterfront where it enters the surface road system with branches to City Point, Boston Marine Industrial Park, and Logan Airport.

The new Silver Line service to Logan Airport provides a direct connection between the Red Line and Southside Commuter Rail services at South Station and the Airport terminals via the South Boston waterfront and the Ted Williams Tunnel (TWT). Silver Line service to Logan Airport began on June 1, 2005. Full service operates on 10-minute headways on weekdays between 6:50 AM and 8:00 PM and serves Terminals A through E at dedicated bus stops. Off-peak and weekend service operates on 12-minute headways. More frequent service is provided during periods of particularly high demand, such as during holidays or large conventions at the Boston Convention and Exposition Center (BCEC).

1 On July 11, 2006, several ceiling tiles in the I-90 tunnels, which connect to Logan Airport, collapsed forcing the closure of the tunnels. The repairs were completed in January 2007 when regular traffic patterns resumed.

Table 5-1 Reported Logan Airport Passenger Ridership Levels

	MBTA		Logan Express Bus		Scheduled and Unscheduled HOV			
	MBTA Blue Line[1]	Silver Line	Air Passengers	Airport Employees	Water Transportation[2]	Van/ Buses[3]	Limousines[4]	Taxi Pool Dispatches
1990	2,854,317	NS	332,321	8,620	181,530	436,857	650,222	1,330,418
1991	2,515,293	NS	367,682	14,562	142,500	417,478	576,578	1,207,611
1992	2,626,572	NS	397,116	17,358	133,297	481,096	538,687	1,266,033
1993	2,604,980	NS	493,908	39,832	159,525	572,771	537,940	1,336,603
1994	3,108,734	NS	617,545	63,923	209,057	656,960	537,746	1,409,505
1995	3,040,868	NS	689,480	105,228	203,829	894,935	637,577	1,499,869
1996	2,974,850	NS	851,463	143,773	175,137	902,704	874,255	1,721,093
1997	2,774,268	NS	816,015	185,229	210,150	963,671	935,604	1,827,244
1998	2,850,367	NS	845,598	212,952	235,253	1,000,565	1,084,369	1,888,281
1999	2,974,045	NS	868,987	180,727	238,002	985,734	1,278,519	1,955,895
2000	3,019,089	NS	923,236	211,717	237,675	1,123,215	1,791,772	2,140,000
2001	2,896,638	NS	885,296	236,395	219,746	899,113	1,061,292	1,790,000
2002	2,670,594	NS	855,632	326,707	197,692	675,200	1,127,666	1,630,000
2003	2,575,899	NS	808,335	400,132	123,148	705,237	1,373,517	1,550,000
2004	2,740,372	NS	857,530	408,297	112,493	761,320	1,448,581	1,710,000
2005	NA	254,608[5]	837,530	397,660	50,000	701,500	1,250,180	1,769,880
2006	**NA**	**642,177**	**891,918**	**418,051**	**115,113**	**775,640**	**1,591,361**	**1,864,238**
Percent Change (2005-2006)	-	-	**6.5%**	**5.1%**	**130%**	**10.6%**	**27.3%**	**5.3%**

NA Data not available.
NS Not in service.
1 2005 and 2006 MBTA Blue Line data are not available.
2 Includes City Water Taxi and Rowes Wharf Water Shuttles.
3 Includes outbound passengers only on services offered by bus or van lines and hotels on a pre-determined schedule and route.
4 Limousines include outbound passengers only.
5 Service began June 1, 2005; ridership for seven month period only.

Silver Line Bus Service between Logan Airport and South Station

Massport has committed significant resources to support the Silver Line service including purchasing eight of the dual mode 60-foot articulated buses specially configured to accommodate luggage for a cost of $13.3 million. All eight Massport buses were in service by January 2006. As of November 2006, infrastructure installation by Massport and the MBTA approached $500,000 for the automatic fare collection equipment (Charlie Cards) at the Airport terminals. Availability of MBTA passes in the terminals is a long-standing goal to increase MBTA ridership. Massport's total net commitment to the Silver Line HOV service will approach $30 million over the next 10 years.

Blue Line Ridership
Blue Line ridership information is unavailable for 2006. However, as noted above, ridership has been fairly consistent over the past 16 years. Over the past several years, the Blue Line and Airport Station have seen substantial improvement. Construction of the new Airport Station was completed in 2004. The most significant change in MBTA service in 2006 was the continuation of conversion from manual to automated fare collection using a card system. By the end of 2006, the automated system replaced subway token use system-wide and provided for more convenient fare collection and improved customer service. Airport Station was one of the first to receive new fare collection equipment during the spring of 2005. Turnstiles were replaced by new fare gates that open automatically upon insertion of an MBTA Charlie Card.

In a joint venture with the MBTA, 13 Charlie Card machines became operational at seven locations in the Logan Airport terminals in November 2006. There are two machines (cash/cashless) in Terminal A, two machines on each side of Terminal B (four total), a total of five machines in three locations at Terminal C and two machines in Terminal E. Machines are proximate to the Silver Line stops and/or main terminal doors. Massport has marketed the Charlie Card machines in the terminals, through press releases and through the Logan TMA. The machines are located immediately adjacent to the Silver Line stops and Massport public service representatives were trained by the MBTA in use of the Charlie Card machines.

One of 13 Charlie Card machines available in Logan Airport terminals

The early upgrade of Airport Station with new fare collection equipment allows the station to serve as a system-wide "hub-station"- one of five planned to provide additional customer service. Since fares are collected using the new equipment, MBTA personnel now focus on assisting customers with inquiries about the transit system. This is particularly useful at Airport Station as many travelers are unfamiliar with Boston's transit system or the Charlie Card system.

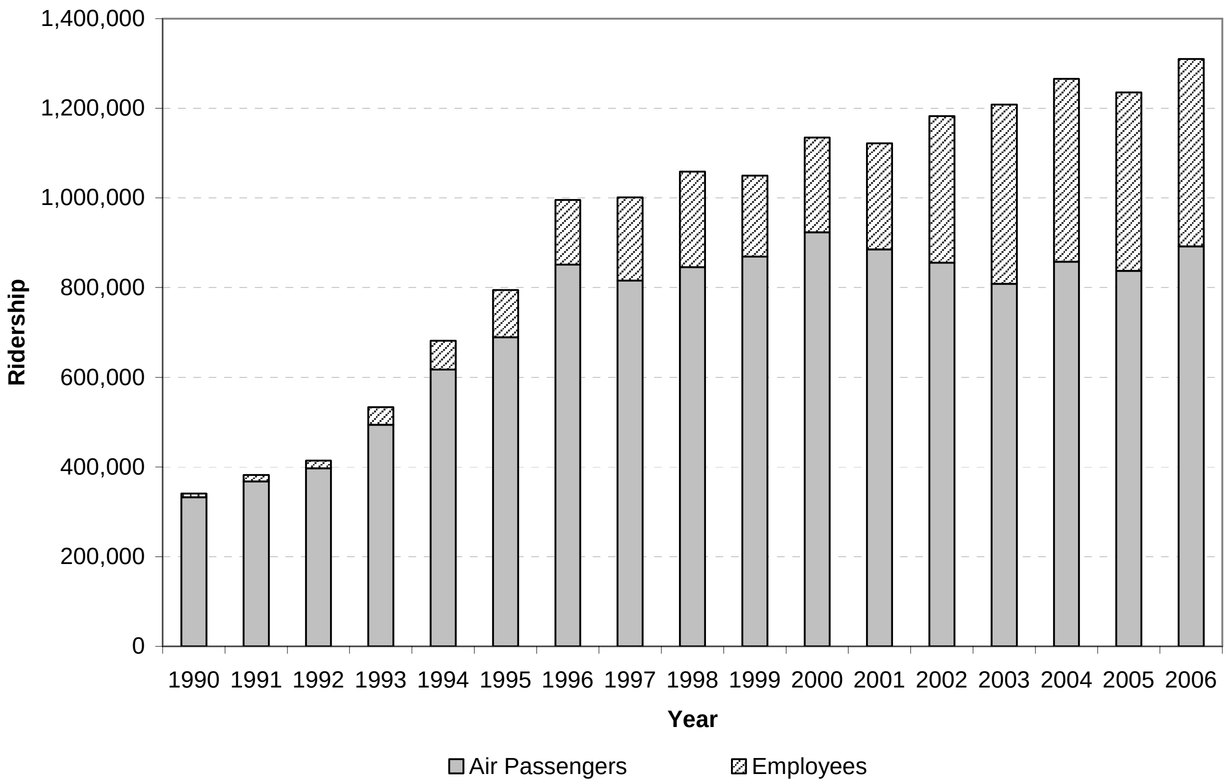
Logan Express Bus Service

Massport offers frequent express bus service to Logan Airport from Braintree, Peabody, Framingham, and Woburn. Full service bus terminals and secure parking are provided at all four locations. The 2006 round-trip fare for the service was $20 for adults, with reduced fares offered for children and seniors. Slight rate increases were introduced in 2007. Parking rates are $11 per day. On weekdays and Sundays, half-hour headways are provided from the Braintree, Woburn, and Framingham locations. One-hour headways are provided at all times at the Peabody location and at all locations on Saturdays. The service is available to both air passengers and Logan Airport employees. After substantial success with the initial Braintree and Framingham lines (both established in 1986), service from Woburn began in November 1992 and service in Peabody began in September 2001. The service was so successful during the early 1990s that parking areas were expanded to encourage and accommodate further ridership increases. In 2004, Massport leased an additional seven acres of land next to the Braintree Logan Express to allow for expansion of the parking supply by 500 spaces. This allows all of the existing spaces to be dedicated to passenger use only.

Massport has an extensive outreach campaign for Logan Express services including placing advertisements in local newspapers such as the Boston Globe North and South Zones, Quincy Patriot Ledger, North Shore Sunday, Woburn Daily News, Stoneham Independent, www.boston.com, and the Metro Shadow Radio. Logan Express ridership trends are shown on Figure 5.3 and Table 5.1. Ridership has been fairly stable over the past three years, with a slight increase in passenger use in 2006, which could partially be attributed to the I-90 tunnel closure. The long-term trend from 1990 to 2006, however, indicates a strong long-term growth. Logan Express bus ridership has not yet returned to year 2000 or pre-September 11, 2001 levels for air passengers, but employee ridership has increased by about 97.5 percent (due in part to the discontinuance of the TMA shuttle

service and closure of the I-90 tunnel). As described in the *2004 Environmental Status and Planning Report (2004 ESPR)*, despite continued targeted marketing in the potential service area, ridership on the Peabody Logan Express remains well below that of the other Logan Express services. Massport continues to evaluate that facility and consider other more cost-effective options for servicing that market. A detailed breakdown of the Logan Express ridership is presented in *Appendix G, Ground Transportation.*

Figure 5-3 Logan Express Bus Ridership



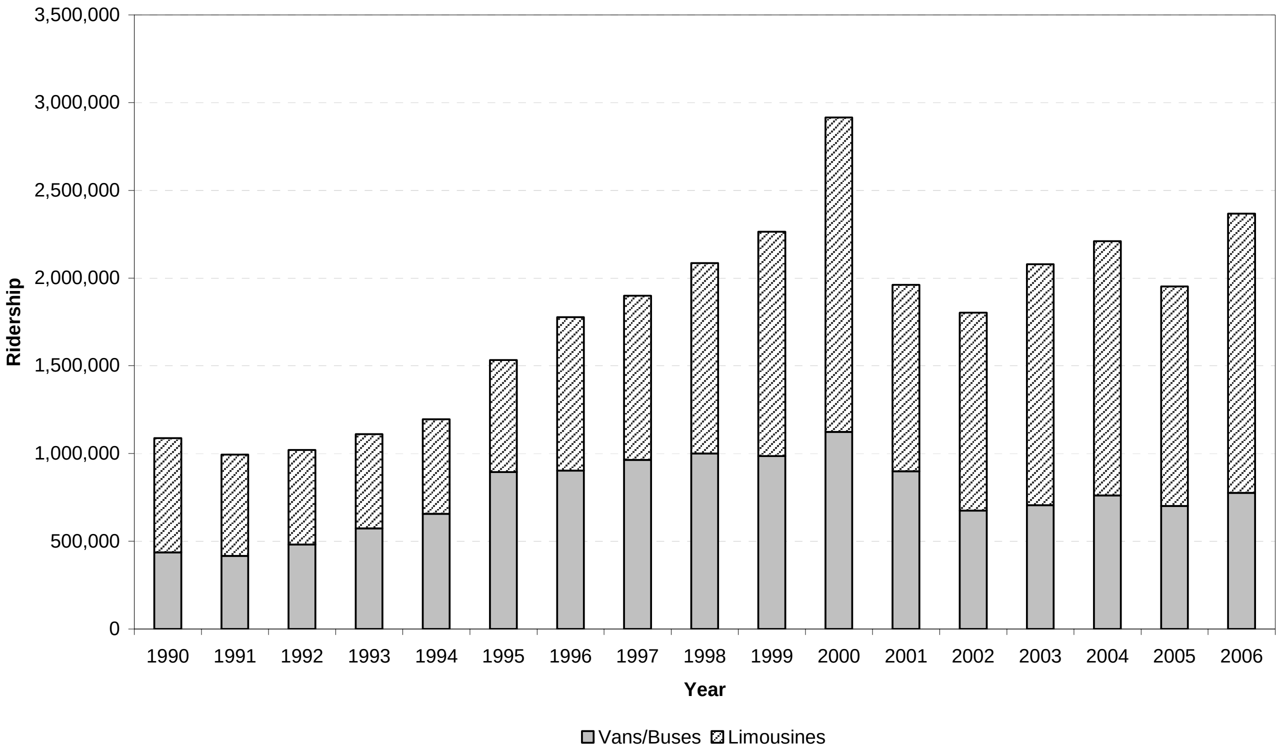
Vans, Buses, and Limousines

Massport continues to support the use of privately operated vans, buses, and limousine services by providing designated curb areas at all terminals. The shared van service includes service between Logan Airport and many hotels in the Greater Boston area. Shared vans also provide service from western Massachusetts and other regional points throughout New England. Massport also offers a 50 percent discount on the ground access fees for HOVs that use alternative fuels such as compressed natural gas (CNG) or electric charges.

As shown in Table 5-1 and Figure 5-4, use of vans, buses, and limousines increased substantially in 2006; however, ridership has yet to reach pre-2001 levels.

The majority of scheduled HOV carriers (including Logan Direct and privately operated services to and from South Station by Plymouth/Brockton and Bonanza bus lines) use a combination of 15- to 40-passenger vehicles and over 40-passenger buses.

Figure 5-4 Limousine and Van/Bus Ridership



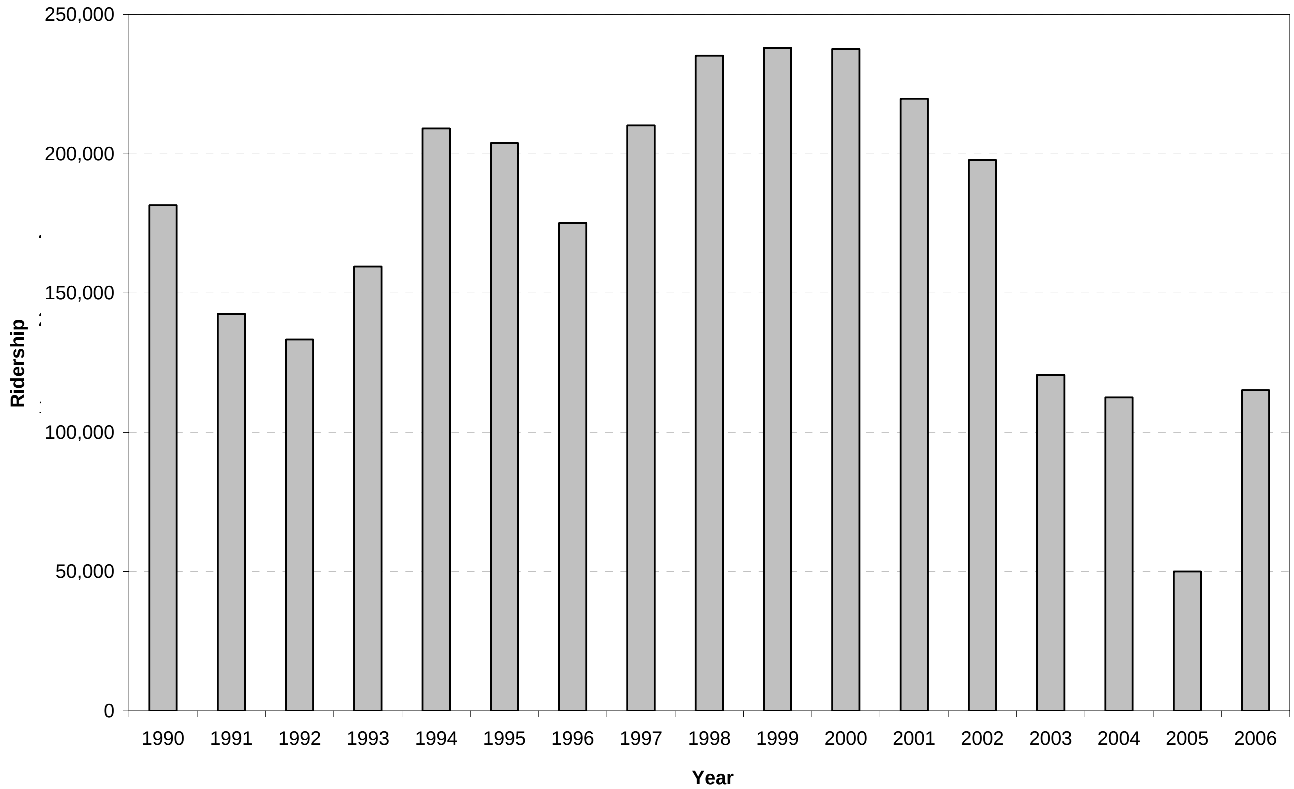
Water Transportation

In 2006, water transportation services were provided by four companies: City Water Taxi, Rowes Wharf Water Shuttle, MBTA Harbor Express, and Boston Harbor Water Taxi. Collectively, these companies serve numerous destinations throughout Boston Inner Harbor. The water taxi landings include Long, Rowes, and Central Wharfs, the World Trade Center and the Moakley Courthouse in South Boston, Lovejoy Wharf near North Station, and stops in the North End, Charlestown, Chelsea, and East Boston. Massport provides courtesy CNG-powered bus service between the Logan Airport dock and all Airport terminals.

With restoration of four water transportation providers (in 2005, available water transportation services decreased from four companies to two, City Water Taxi and Rowes Wharf Water Shuttle), the ridership decline in 2005 was recovered and improved upon (as shown in Table 5-1 and on Figure 5-5). There were over 115,000 water transportation riders in 2006.

The addition of two new companies with their specific market focus has expanded service options as well as opportunities to market water transportation to Logan Airport passengers. The addition of new operators also reinforces the existing management system at the facility, which was specifically developed to allow new and varied operators to use the Logan Airport dock.

Figure 5-5 Water Transportation Ridership



Additional Transportation Services

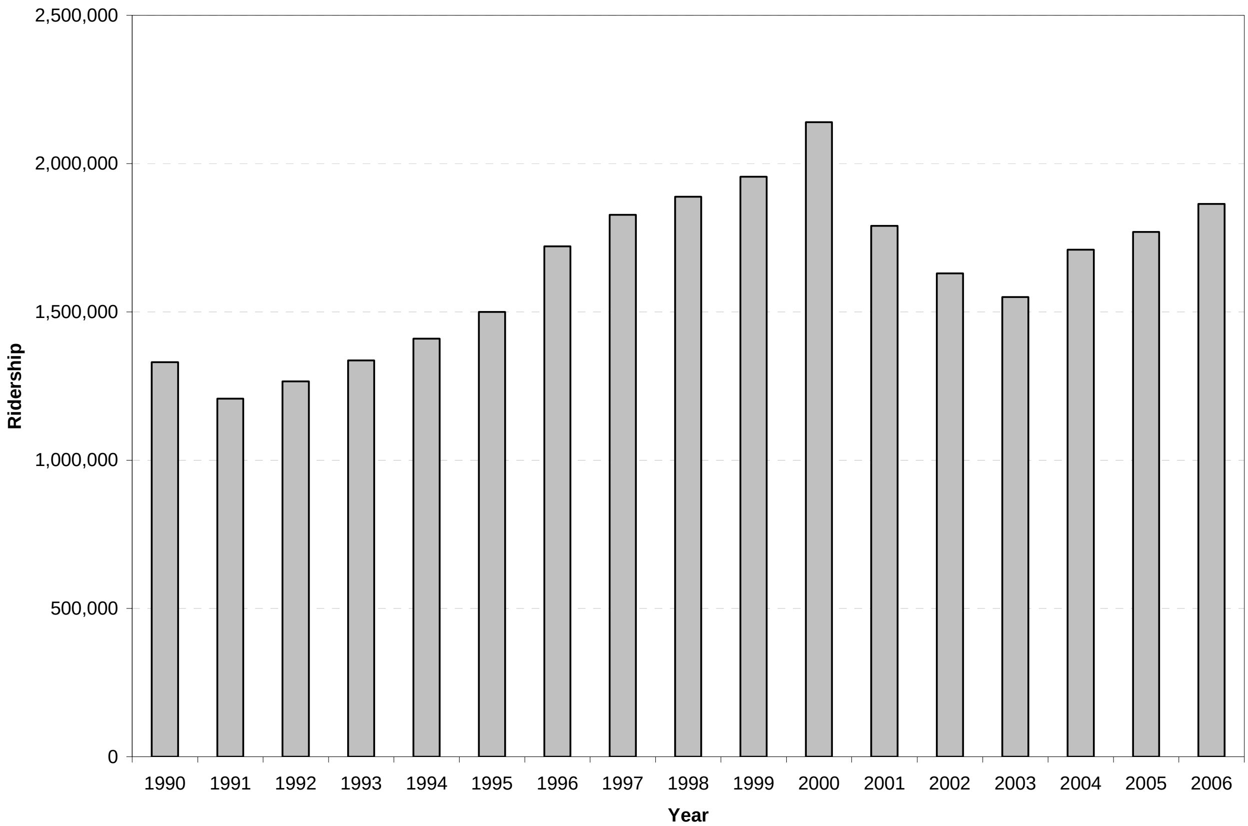
In addition to the HOV options available, Logan Airport patrons can access the Airport by a number of other transportation modes, including: drop-off and pick-up by private automobile; driving to Logan Airport and parking (for short or long periods); taxicabs; and rental cars. Although these modes are categorized as non-HOV, they frequently carry more than one passenger per vehicle. Air passenger survey results for 2003 estimated an average vehicle occupancy of 2.05 for these modes.

Taxicabs

Taxicab ridership trends are reflected in the total number of taxis dispatched from Logan Airport (serving outbound passengers). As shown in Table 5-1 and Figure 5-6, the total taxi dispatch volume for 2006 was 1.86 million, a 5.1 percent increase from 2005. Even considering this increase, taxicab ridership to Logan Airport has still not returned to 2000 levels.

The available taxi data only reports dispatches from Logan Airport. The data do not include suburban or city taxis that drop passengers at Logan Airport and deadhead back to where they originated because they are not authorized to pick up passengers at Logan Airport.

Figure 5-6 Taxi Dispatches



Rental Car Service

Eight rental car agencies serve Logan Airport. Six are located on-Airport in the Southwest Service Area (SWSA) while two agencies operate on Route 1A, north of the Airport. Each rental car agency operates shuttle buses between the terminals and their respective on- or off-Airport facilities. Massport continues to explore the feasibility of options for rental car consolidation. In early 2006, Massport initiated a feasibility study for a proposed consolidated rental car facility (ConRAC) in Logan Airport's SWSA. Phase 1 of this study was completed on June 30, 2006. The study examined the following issues:

- Financing
- Order of magnitude costs
- Environmental benefits

The project, known as the SWSA Redevelopment Program, currently calls for a multilevel ConRAC garage with approximately 5,000 Ready/Return spaces, a Customer Service Center, and Quick Turnaround Area, which would contain maintenance/car wash buildings and fueling facilities, as well as adequate space for surface rental car storage/parking. The ConRAC is one component of an overall SWSA Redevelopment Program that would also include: capacity for up to 3,000 commercial parking spaces, as well as environmental remediation, new infrastructure (roadways, utilities, etc.) improvements to existing roadways, intelligent transportation systems technologies, a single shuttle bus system serving all rental car companies, and visual and sound

buffering along the boundary between the Airport and the community. Massport believes there will be environmental benefits from the SWSA Redevelopment Program, including:

- Improved air quality as a result of a consolidated shuttle bus system, powered by a fleet of alternative fuel vehicles.
- Incorporation of sustainable design elements in the building construction and operations.
- Significantly improved efficiency in operations and customer service.
- Capacity to respond to the growth in demand for rental cars and for convenient passenger parking within the Airport's constrained footprint.
- Reduced impact of rental car operations on the East Boston community and adjacent neighborhoods.
- Improved level of service at several area intersections.

In coordination with the rental car companies, Massport is developing conceptual designs for this project, and once the preferred alternative is selected, further details will be provided. The SWSA Redevelopment Program will comply with requirements of the Logan Airport Parking Freeze.

Logan Transportation Management Association (TMA)

Massport encourages employees to use the available public transportation options. Massport strives to reduce the number of Airport employees commuting by private automobile, to enhance commuter options, and to reduce traffic and parking demands at the Airport. To help accomplish these objectives, Massport founded the Logan TMA in 1997. The Logan TMA's goals are:

- Reduce Airport employee parking needs, traffic congestion, air pollution, and commuting costs by organizing/supporting alternatives to drive-alone commuting.
- Enhance public and private transportation services to Logan through advocacy/support for expanded HOV services and discount fares for Airport employees.
- Provide a forum for Logan Airport tenants and employees to address common transportation concerns, and to work with government entities and each other to create coordinated transportation management programs.

The Executive Office of Transportation (EOT), through its MassRIDES program provides the Logan TMA coordinator role at state expense, rather than the Logan TMA's expense. In expanding EOT's commitment to administer the Logan TMA, Massport will maintain its current level of effort, including both cash contributions and in-kind services to enhance the Logan TMA's effectiveness. Massport contributes $65,000 to the Logan TMA annually and provides space and equipment for the Logan TMA transportation store in Terminal C.

The Logan TMA advises employers on transit benefits and provides information on available commuting transportation alternatives, ride-matching services, and reduced-rate HOV/transit fare options. In addition, the Logan TMA facilitates the purchase of reduced fare MBTA transit passes. The Logan TMA actively encourages airlines, rental car companies, cargo transport companies, and other tenants at Logan Airport to join the Logan TMA as a means to offer commuting incentives to their employees and to help to reduce traffic growth and parking demands at the Airport. To encourage membership, the Logan TMA instituted individual membership for employees whose companies are not corporate members. A $10 monthly fee (or $100 annual fee) entitles the individual member to all Logan TMA services and privileges.

In 2006, the Logan TMA was comprised of nine organizations (Massport, BAA Boston, Delta Air Lines, Jet Blue Airways, Signature Flight, Westfield Concession, Travelex, Brookstone, and McDonalds), representing about 1,000 employees at Logan Airport (Table 5-2). Three organizations (Logan Airport Hilton, Smartcartes, and US Airways) left the Logan TMA in 2006. These organizations left the Logan TMA because they felt that the dues payments were not yielding any tangible increase in HOV participation among their employees. Massport and the TMA are focusing on broadening the range of TMA benefits. Three new organizations (Travelex, Brookstone, and McDonalds) joined the Logan TMA in 2006.

Table 5-2 Logan TMA Membership 2006

Year	Number of Employees
1997	3,100
1998	NA
1999	6,200
2000	6,200
2001	6,000
2002	4,300
2003	6,000
2004	5,200
2005	2,874
2006	1,009
Percent Change (2005-2006)	**(65%)**

Source: Logan TMA.
NA Data not available.

Benefits and services provided to Logan TMA members in 2006 included the following:

- Discounted fares on Logan Express, MBTA transit services, water shuttle services, and sale of monthly T-passes through member employers and the Logan TMA Transportation Store. Approximately 450 T-passes were sold monthly.
- An emergency Guaranteed Ride Home program for those employees who regularly carpool or take transit. About 75 to 80 members are enrolled in this service. In 2006, no member utilized the service.

- Computerized ride-matching services for carpooling and vanpooling.
- Company Commuter Mobility Programs — The Logan TMA generates individualized commuter mobility programs for member organizations that present the best actions a company can take to reduce its own employees' dependence on the automobile.
- Marketing Events — The Logan TMA participates in Airport-wide, community, and individual employer events, such as "Transportation Awareness Day," to disseminate information about Logan TMA services.
- Advocacy — The Logan TMA advocates for improved service and reduced fares for its members from Massport, the MBTA, or other providers of mass transit and other alternative forms of transportation.

New TMA initiatives include:

- A preliminary plan to reinstate the East Boston early morning shuttle service. This new service (Logan Sunrise Shuttle) began on August 6, 2007.
- In 2007, Massport will begin reserving a number of preferential parking spaces for carpoolers and vanpoolers. It is anticipated these spaces will be raffled off to qualified members.
- The Logan TMA has created an incentive program called Commuter Cash to financially reward employees for using various methods of HOV. While the program was created in 2006, it did not become operational until February 2007.

In addition to enhancing overall access to the Airport for employees, the Logan TMA is one of the key programs that Massport supports in order to fulfill its long-range environmental commitment to achieve 35.2 percent of passengers using HOV modes to access to Logan Airport when the annual passenger level reaches 37.5 million.

Ground Access Traffic Conditions

In July 2006, the portion of I-90 connecting the City of Boston and areas to the south and west of Boston with Logan Airport was closed following an accident that rendered the tunnel unsafe. The roadway was not fully reopened until January 2007. Due to the critical role I-90 plays in access to Logan Airport, Massport concluded that traffic volumes to/from the Airport would be uncharacteristic of typical travel patterns and would provide results that showed large decreases in vehicular volume and vehicle miles traveled (VMT). Rather than present atypical results, Massport suspended its traffic volume counts for gateways (areas that serve as entrances to the Airport grounds) for 2006. Therefore no traffic volume or VMT information is available for 2006.

The traffic count program resumed in the spring of 2007, with data collected during the last week of April. This time period was chosen to coincide with the 2007 passenger survey. Data on gateway traffic volumes, associated VMT, and passenger survey results will be provided in the *2007 EDR*.

2006 Parking Conditions

Massport manages its parking supply at Logan Airport to promote long-term rather than short-term parking, to support efficient parking utilization, and to comply with the provisions of the Logan Airport Parking Freeze. Security restrictions on curbside parking, however, have made it necessary for Massport to alter its parking rates for short-term parking to accommodate pick-up and drop-off activity. Massport has added hourly parking spaces specifically designed for this purpose.

The number of commercial parking spaces allowed at Logan Airport is limited by the Logan Airport Parking Freeze (310 Code of Massachusetts Regulations 7.30) which is an element of the Massachusetts State Implementation Plan (SIP) under the Federal Clean Air Act (CAA). Table 5-3 presents the total number of parking spaces permitted on-Airport and Massport's allocation of these spaces between commercial and employee spaces. Since 2001, Massport has had a limit of 20,692 total spaces, with 15,467 spaces designated for commercial use and 5,225 spaces for employee use. While the total limit on spaces has remained unchanged since 2001, the allocation among various on-Airport parking facilities has changed due primarily to the impacts of ongoing construction projects. This allocation is presented in *Appendix G, Ground Transportation*.

Table 5-3 Logan Airport Parking Freeze Summary

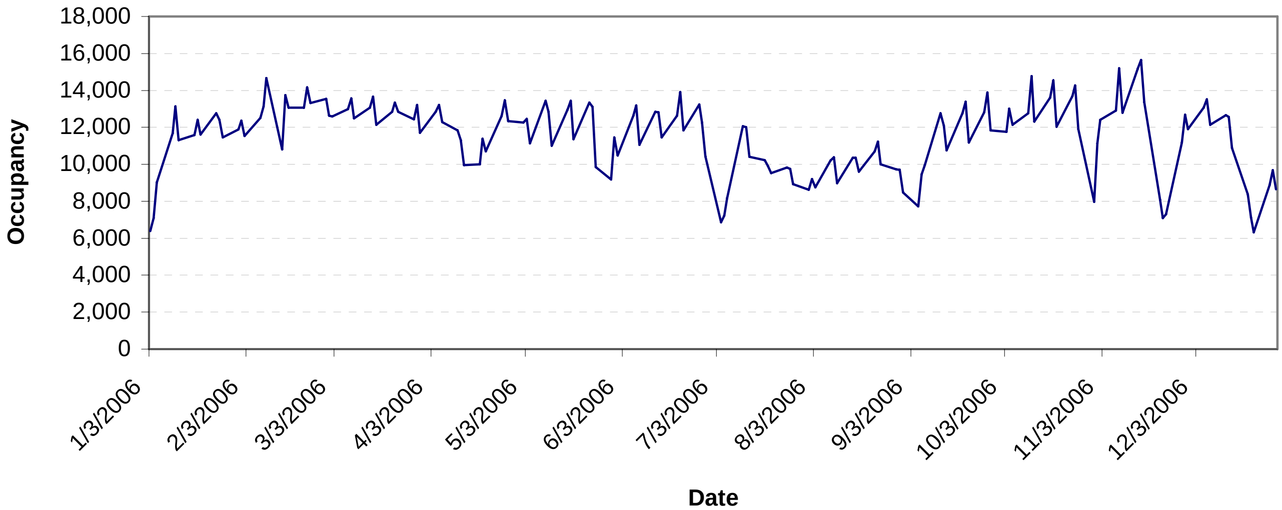
	Type of Spaces		
Year	On-Airport Commercial Spaces	On-Airport Employee Spaces	Total Logan Airport Parking Spaces Permitted
1992 - 1994	12,215	7,100	19,315
1995 - 1997	12,890	6,425	19,315
1998 - 2000	14,090	5,225	19,315
2001[1] - 2006	15,467	5,225	20,692

Source: Massport.
1 In 2000, the Massachusetts Department of Environmental Protection (MDEP) approved an amendment to the Logan Airport Parking Freeze to accommodate the transfer of 1,377 spaces originally located in the East Boston Parking Freeze Area to the Logan Airport Parking Freeze Area.

Parking Demand

On-Airport commercial parking occupancy typically peaks mid-week (Tuesday through Thursday) with lower occupancies occurring on other days. The number of vehicles parked at Logan Airport in commercial spaces over the course of any 24-hour period was derived from annual data for Tuesdays, Wednesdays and Thursdays throughout 2006, and the results are presented in Figure 5-7. The data represent the cumulative number of vehicles parked at Logan Airport over the course of 24 hour periods. These data do not represent the number of vehicles simultaneously parked in commercial spaces at Logan Airport at any time. At no time were the Logan Airport Parking Freeze limits exceeded.

Figure 5-7 2006 Weekly Maximum Commercial Parking Occupancies



Source: Massport, Parking Operations Unit.
Note: Maximum commercial parking spaces available in 2006 were 15,467.
Values represent the cumulative number (not the simultaneous number) of airport vehicles parked during a peak 24-hour period and reflect multiple uses of a single parking space on any one day. The majority of vehicles park at the Airport for less than four hours. Values do not reflect commercial vehicles parked on-Airport at any one time.

Parking Duration

Total parking activity decreased by 8.4 percent between 2005 and 2006. Table 5-4 presents combined annual activity for Logan Airport parking facilities. In 2006, 59 percent of all parking activity at Logan Airport was between zero and four hours, down over 116,000 tickets (about 6.6 percent) from 2005. This decrease continues a downward trend since 2004 and is a reflection of Massport initiatives to reduce short-term parking and overall VMT at the Airport.

In 2006, overall parking exits decreased by about 8.4 percent. A portion of this decrease is likely attributed to the closure of I-90, which reduced the number of passengers arriving to the Airport via automobile.

Table 5-4 Parking Exits by Length of Stay

		0-4 hrs.	4-24 hrs.	1-4 days	4 days	Total
1990	Tickets	2,269,558	381,094	588,720	125,649	3,365,021
	Percent	67%	11%	17%	4%	100%
1991	Tickets	NA	NA	NA	NA	NA
	Percent	NA	NA	NA	NA	NA
1992	Tickets	NA	NA	NA	NA	NA
	Percent	NA	NA	NA	NA	NA
1993	Tickets	2,026,635	329,549	546,282	163,279	3,065,745
	Percent	66%	11%	18%	5%	100%
1994	Tickets	2,002,866	324,706	554,519	187,868	3,069,958
	Percent	65%	11%	18%	6%	100%
1995	Tickets	2,098,581	344,446	583,313	184,177	3,210,537
	Percent	65%	11%	18%	6%	100%
1996	Tickets	2,582,251	308,397	524,942	164,799	3,580,389
	Percent	72%	9%	15%	5%	100%
1997	Tickets	2,534,822	344,870	532,679	169,899	3,582,270
	Percent	71%	10%	15%	5%	100%
1998	Tickets	2,133,007	322,326	524,851	177,705	3,157,889
	Percent	68%	10%	17%	6%	100%
1999	Tickets	2,097,678	332,249	604,562	212,817	3,247,306
	Percent	65%	10%	19%	7%	100%
2000	Tickets	2,218,180	345,735	633,277	225,926	3,423,118
	Percent	65%	10%	19%	7%	100%
2001	Tickets	1,649,285	237,272	456,998	192,000	2,535,555
	Percent	65%	9%	18%	8%	100%
2002	Tickets	1,743,135	189,440	479,336	156,130	2,568,041
	Percent	68%	7%	19%	6%	100%
2003	Tickets	1,813,584	149,760	595,983	173,651	2,732,978
	Percent	66%	5%	22%	6%	100%
2004	Tickets	1,773,175	252,480	722,812	221,108	2,969,575
	Percent	59%	9%	24%	8%	100%
2005	Tickets	1,751,761	290,623	723,547	247,874	3,013,805
	Percent	58%	10%	24%	8%	100%
2006	Tickets	1,634,898	262,152	660,184	202,366	2,759,600
	Percent	59%	10%	24%	7%	100%
Percent Change (2005-2006)		**(6.6%)**	**(9.8%)**	**(8.8%)**	**(18.4%)**	**(8.4%)**

Source: Massport.
NA No data available.

2006 Parking Costs

There are four airport parking areas for which Massport sets and controls parking rates. These rates are identified in Table 5-5. Since Massport has no control over off-airport parking rates, these rates are not provided. Many off-airport areas, such as PreFlight parking in Chelsea, are independently owned and operated and are outside of the Logan Airport Parking Freeze.

Table 5-5 2006 On-Airport Parking Rates

Location	Cost ($)	Location	Cost ($)
Central Parking		**Terminal E Lots 1 and 2**	
0 to 30 minutes	2.00	0 to 30 minutes	2.00
31 minutes to 1 hour	5.00	31 minutes to 1 hour	5.00
1 to 1.5 hours	8.00	1 to 1.5 hours	8.00
1.5 to 2 hours	11.00	1.5 to 2 hours	11.00
2 to 3 hours	14.00	2 to 3 hours	14.00
3 to 4 hours	17.00	3 to 4 hours	17.00
4 to 7 hours	20.00	4 to 7 hours	20.00
7 to 24 hours	22.00	7 to 24 hours	22.00
Additional days 0 to 6 hours	11.00	Additional days 0 to 6 hours	11.00
Additional days 6 to 24 hours	22.00	Additional days 6 to 24 hours	22.00
Terminal B Garage		**Economy Parking**	
0 to 30 minutes	2.00	Daily Rate	16.00
31 minutes to 1 hour	5.00	Additional days 0 to 6 hours	8.00
1 to 1.5 hours	8.00	Additional days 6 to 24 hours	16.00
1.5 to 2 hours	11.00	Weekly Rate (6-7 days)	96.00
2 to 3 hours	14.00		
3 to 4 hours	17.00		
4 to 7 hours	20.00		
7 to 24 hours	24.00		
Additional days 0 to 6 hours	12.00		
Additional days 6 to 24 hours	24.00		

Source: Massport.

Parking fees can be pre-paid at kiosks inside the terminals and pedestrian walkways. Pay stations are located at the entrances to the Central Garage and Terminal E parking lot. The percentage of parking patrons using this service increased over the course of 2006, ending at 79.7 percent of total parkers for the month of December, and a 75.3 percent average for 2006.

New 2006 Parking Services

The Parking PASSport and Parking PASSport GOLD programs were in service for the first complete year in 2006 (programs were implemented in 2005). Massport offers guaranteed parking through the new program, Parking PASSport Gold. Parking PASSport Gold provides a guaranteed parking space in dedicated areas of the Terminal B and Central garages and eliminates the need to circle the garage looking for available spaces. The second program, Parking PASSport, is geared toward travelers, companies, or other organizations that are not likely to make use of HOV transit opportunities. In such cases, providing dedicated immediate parking reduces the need for vehicles to circulate the garage or Airport looking for parking spaces or circulating to overflow parking, thereby reducing VMT. Parking PASSport also allows users to enter and exit the garage without the need to pull the ticket. This service, however, does not guarantee a parking space within the terminal. As of December 31, 2006 Parking Passport GOLD had 1,363 customers.

Ground Access Planning

Massport has established a number of goals related to the ground access system, parking facilities, and other transportation infrastructure that serve air passengers, Airport employees, and other Airport users. Massport continues to plan, design and implement ground access initiatives to address these goals. These initiatives are continuously refined to account for the changing national, regional and local environments that affect Logan Airport and its users. Table 5-6 lists each ground access goal and updates Massport's initiatives associated with each goal. The details of each initiative, where appropriate, have been described in other parts of this chapter.

Several elements of Massport's Sustainable Initiative are reflected in the ground access planning activities, which are primarily aimed at reducing reliance on single occupant vehicles for passengers, employees and other Airport users. These measures include:

- Promotion and support of HOV modes (Logan Express, MBTA, water transportation)
- Establishment, support of, and active membership in the Logan TMA
- Improvement of terminal access (curbs) for HOV modes

Combined, these measures encourage airport users to use alternative HOV modes of transportation to access Logan Airport.

Table 5-6 Ground Access Planning Goals and Progress

Goal	2006 Update
Increase air passenger HOV mode share to 35.2 percent by the time Logan Airport accommodates 37.5 million annual air passengers	A recent air passenger survey, administered in 2004, demonstrated a 30.3 percent HOV mode share for 26.1 million air passengers. A more recent survey was conducted in April 2007 and will be included in the *2007 EDR*. Massport continues to provide and actively promote numerous HOV options that are available to air passengers.
Reduce employee reliance on commuting alone by private automobile	Massport continues to support the Logan TMA with $65,000 in fees annually as well as space and equipment for the Logan TMA Store in Terminal C.[1] Through a partnership with the Executive Office of Transportation, the Commonwealth now provides Massport with a Logan TMA coordinator. This allows Massport to use funds from Logan TMA members exclusively for transportation services. A recent employee survey, administered in 2001, showed an employee HOV mode share of 26.8 percent. A new employee survey was completed in 2007 and will be included in the *2007 EDR*.
Increase the overall efficiency of the metropolitan transportation system through interagency coordination	Massport participates in the Metropolitan Planning Organization (MPO) process to promote funding of transportation system options that enhance access to the Airport. Massport and the MBTA have worked together on several initiatives including the newly completed Airport Blue Line station, the newly opened Silver Line extension to the Logan Airport (formerly known as the Airport Intermodal Transit Connector, AITC), and the Urban Ring planning (underway).
Improve management of on-Airport ground access and infrastructure through technology	Massport disseminates ground access and parking information through the internet (www.massport.com), a toll-free telephone number (1-800-23-LOGAN), Smartraveler and in-Airport kiosks. Massport is considering providing variable message signs in the Ted Williams Tunnel to alert arriving passengers to parking restrictions. The ability to go directly to available parking locations can help reduce VMT associated with circling the Airport or parking garage.
Provide adequate, long-term parking within the limits of the Logan Airport Parking Freeze	Phase II of the West Garage is complete and provides three more levels of parking on the Central Garage as discussed in *Chapter 3, Airport Planning*. The addition of these 2,880 spaces remains within the limits of the Logan Airport Parking Freeze.

1 Terminal D was incorporated into Terminal C in early 2006.

6

Noise Abatement

Introduction

Massport strives to minimize the noise effects of airport operations on its neighbors through the use of a variety of noise abatement procedures and tools. Logan Airport has one of the most extensive noise abatement programs of any airport in the nation including: residential and school sound insulation programs; flight tracks designed to optimize over-water operations (especially during nighttime hours); and preferential runway use goals. The foundation of Massport's comprehensive noise abatement program is the *Logan Airport Noise Abatement Rules and Regulations*[1] (the Noise Rules) which have been in effect since 1986. Massport's Noise Abatement Office (NAO) is responsible for the implementation of the noise abatement measures.

This chapter describes noise conditions at Logan Airport related to airport operations during 2006, and compares the findings to those for 2005. Noise conditions for 2006 were assessed primarily through computer modeling supplemented by the analysis of measured noise levels from Logan Airport's noise monitoring system. Information presented includes summaries of the operational data used in the noise modeling, as well as the resultant annual Day-Night Sound Level (DNL) noise contours, a comparison of the modeled results with measured levels from the monitoring system, and estimates of the population residing within various increments of noise exposure. Analyses also include a number of supplemental metrics including Logan Airport's Cumulative Noise Index (CNI) and reporting on the times above (TA) various threshold sound levels. Massport's progress on implementing noise abatement measures also is presented.

Key Findings

Highlights from 2006 are:

- Massport completed the construction of Runway 14-32, which opened in late November 2006. The runway was used, as planned, primarily for arrivals over Boston Harbor during December 2006.

1 *Logan Airport Noise Abatement Rules and Regulations* codified at 740CMR 24.01 et seq.

- While annual operations slightly decreased from 409,066 in 2005 to 406,119 (a decrease of 0.7 percent), passenger levels increased from 27.1 million to 27.7 million (2.4 percent), reflecting increased load factors (a greater number of passengers per aircraft operation) and demonstrating that airlines continue to recover after September 11, 2001. The 2006 aircraft operations levels remained below historic peaks.
- Daily operations in 2006 averaged approximately 1,113 compared to approximately 1,121 in 2005, a decrease of about eight operations per day.
- The overall number of people exposed to DNL values greater than 65 decibels (dB) decreased compared to 2005. An estimated 5,583 people were exposed to DNL levels greater than 65 dB in 2006, compared to 6,477 in 2005, and 9,438 in 2004. For the second year in a row, fewer than 7,000 people experienced levels of 65 dB DNL and above.
- The 2006 CNI of 152.6 Effective Perceived Noise Level (EPNdB) remained well below the cap of 156.5 EPNdB. The CNI decreased compared to 2005 primarily because of decreased use of recertificated aircraft by cargo operators.
- Massport continued the installation of an improved noise and operations monitoring system, and acceptance testing is expected to take place in 2007.
- The noise modeling process continued to use the automated altitude profile and noise contour generation software first used by Massport for the *2004 Environmental Status and Planning Report* (*2004 ESPR*). This software automates the production of noise contours directly from individual radar traces (the radar systems collected 401,483 radar traces and of these, 363,563 radar traces (91 percent) retained enough information for modeling). While increasing collection of tracks from 2005, (an increase of over 9,000 tracks) the system remained consistent with 91 percent of tracks available for modeling for both 2005 and 2006.
- The number of residential dwelling units for which Massport provided sound insulation in 2006 was 857. This is the largest number of units to receive Massport-sponsored sound insulation in one year since the beginning of the sound insulation program. The majority of the units insulated in 2006 were in Chelsea. The Chelsea program began in 2005 as a pilot program and expanded in 2006. The focus of this program is to fulfill federal and state mitigation commitments related to the opening of Runway 14-32. Since the program's inception, the total number of dwelling units receiving sound insulation is 9,943.
- In accordance with the mitigation commitments from the Logan Airside Improvements Planning Project,[2] this *2006 Environmental Data Report* (*2006 EDR*) reports on dwell and persistence in the neighborhoods that surround Logan Airport.

Regulatory Framework

FAR Part 36

Logan Airport works within a framework of federal aviation regulations that limit an airport operator's ability to control noise. For example, the Federal Aviation Administration's (FAA) Federal Aviation Regulation (FAR) Part 36 sets noise limits for aircraft certification and the procedures by which aircraft noise emission levels must be measured to determine compliance. The regulation defines limits for turbojets, turboprops, and helicopters,

2 *Logan Airside Improvements Planning Project Final EIS*, Section 4.2.3 PRAS Monitoring and Reporting, June 2002.

classifying turbojets in particular into categories referred to as stages based on noise levels at each of three locations: takeoff, landing, and to the side of the runway during takeoff (sideline). The stages are:

- Stage 1 aircraft are the oldest and usually loudest operations, having preceded the existence of any noise emission regulation. Rare examples include old, restored civil or military aircraft.
- Stage 2 aircraft are slightly less old and loud; they were the first aircraft types required to meet a noise limit. A subsequent regulation, FAR Part 91 (see below), prohibits a person from operating a Stage 2 aircraft in the continental United States (U.S.) unless its takeoff weight is 75,000 pounds or less.
- Stage 3 aircraft are the newest and quietest of the commercial jets, though some are Stage 2 aircraft fitted with hushkits to allow them to minimally meet the Stage 3 noise limits.
- Stage 4 aircraft are under design or are in early construction. When in production they will be required to be at least 10 dB quieter than Stage 3 aircraft. Jet aircraft certified after January 1, 2006 must meet the Stage 4 limits. Though not required, many of the aircraft in the 2006 Logan Airport fleet would also meet the new Stage 4 noise limits if they were recertificated.

FAR Part 150

First implemented in February 1981, FAR Part 150 defines procedures that an airport operator must follow if it chooses to conduct and implement an airport noise and land use compatibility plan. Part 150 Noise Compatibility studies require the use of DNL to evaluate the Airport noise environment, and it identifies noise compatibility guidelines for different land uses depending on their sensitivity. Key values include a DNL of 75 dB, above which no residences, schools, hospitals, or churches are considered compatible and a DNL of 65 dB, above which those land uses are considered compatible only if they are sound insulated.

Noise abatement or mitigation measures that an airport operator must consider in a Part 150 study include acquisition of incompatible land, construction of noise barriers, sound insulation of buildings, implementation of a preferential runway program, use of noise abatement flight tracks, implementation of airport use restrictions, and any other actions that would have a beneficial effect on the public.

While Massport has implemented variations of all of these and additional measures at Logan Airport, Massport has never filed an official Part 150 noise compatibility study with the FAA because all of Logan Airport's program elements, while regularly reviewed and updated, preceded the promulgation of Part 150 and are effectively grandfathered under the regulation.

FAR Parts 91 and 161

When Congress adopted Public Law (PL) 101-508, subtitled the *Airport Noise and Capacity Act of 1990* (the Act), it required the Secretary of Transportation to:

- Establish a schedule for the phase-out of Part 36 Stage 2 aircraft by the year 2000.
- Establish a program for FAA review of all new airport noise and access restrictions limiting operations of Stage 2 aircraft.
- Establish a program for FAA review and approval of any restriction that limits operations of Stage 3 aircraft.

Part 91, mentioned earlier, set the schedule for conversion of Stage 2 aircraft to meet Stage 3 noise limits by December 31, 1999, but exempted aircraft less than 75,000 pounds maximum gross takeoff weight. This excluded, and still excludes, most business jets. Part 91 also permitted operators of the heavier aircraft to be retrofitted or operating manuals to be modified and the aircraft to be recertificated to meet minimum Stage 3 noise limits resulting in only minimal improvements in noise for some aircraft types. Though many of these aircraft have since been taken out of service voluntarily, primarily due to high operating costs, a few remain in the cargo and charter fleets operating at Logan Airport.

The other elements of the Act were addressed through FAR Part 161. It prescribes detailed benefit/cost analyses and notice requirements for an airport operator to follow if the operator wants to adopt a Stage 2 or Stage 3 noise or access restriction. Although several airports have embarked on such efforts in the past 16 years, only one, a general aviation (GA) airport (Naples Airport, Florida), has been found by FAA to have complied with Part 161 analysis, notice, and documentation requirements, for a ban on Stage 2 jet operations. Even in that particular case, however, FAA found the GA airport to be in violation of prior grant assurances.

Here, too, Massport benefits from early implementation of its Noise Rules. Promulgated in 1986, the Rules preceded the requirements of Part 161 and are grandfathered under the regulation. Future, more stringent amendments or alternative regulatory initiatives affecting Stage 3 aircraft would require FAA approval under Part 161.

In 2006 Massport requested an opinion from the FAA regarding the pursuit of a Part 161 waiver. FAA informed Massport that a waiver or exemption from the requirements of Part 161 is not authorized under, or consistent with, federal statutory and regulatory requirements. A copy of FAA's letter to Massport was provided in *Appendix H, Noise Abatement* of the *2005 EDR*.

Logan Airport Noise Abatement Rules and Regulations

Massport's primary mechanism for reducing noise impacts from Logan Airport's operations is use of its Noise Rules. The Noise Rules were designed to reduce noise impacts by encouraging use of quieter aircraft; by requiring decreased use of noisier aircraft; and, by limiting nighttime activity by noisy Stage 2 types. Many secondary goals aimed at limiting noise in specific areas also were stated.

Specific provisions of the Noise Rules, which continue to serve these goals, include:

- Limiting cumulative noise exposure at Logan Airport (as measured by Massport's Cumulative Noise Index or CNI) to a maximum of 156.5 EPNdB
- Maximizing use of Stage 3 aircraft
- Restricting nighttime operations by Stage 2 aircraft
- Placing limitations on times and locations of engine run-ups and use of auxiliary power units
- Restricting use of certain runways by noisier aircraft and time of day

Noise Modeling Process

The DNL, CNI, and time above (TA) noise metrics reported annually by Massport provide various means of interpreting and comparing Logan Airport's complex noise environment from one year to the next. The noise context is influenced by numbers of operations, types of aircraft operating during the day and at night, use of various runway configurations, and the location and frequency of use of flight paths to and from the runways. Changes in any one of these operational parameters from one year to the next can cause changes in the values of the noise metrics and alter the shapes of the noise exposure contours that represent the accumulation of noise events during an average day.

Massport continues to make use of the state-of-the-art improvements in the noise modeling process, as described in the *2004 ESPR*. These developments in noise modeling technologies and techniques, which were employed in the preparation of the *2005 EDR* and this *2006 EDR* and will be used in future years, include:

- **Continued use of the latest update to the FAA's Integrated Noise Model (INM), while retaining the unique capability to account for over-water sound propagation and hill effects at Logan Airport.** The INM has been updated to INM Version 6.2a. Massport's use of the latest FAA-approved version of the INM (INMv6.2a), along with additional provisions to accommodate the Airport context's unique water and terrain characteristics that have been shown through earlier technical studies to affect sound propagation into surrounding neighborhoods, has improved the modeling results. Logan Airport is the only airport in the world that incorporates these features in its approved modeling process.
- **Continued use of a new radar data acquisition system known as a long-range PASSUR for the source of all radar-based operations data.** The PASSUR system provides Massport with radar data in an efficient manner in order to be more responsive to operational and noise issues at the Airport.
- **Use of automated altitude profile and noise contour generation software.** Massport purchased licenses to run two additional software packages, RealProfiles™ and RealContours™. The *2004 ESPR* included a comparative analysis of the results of the standard INM modeling approach with that of RealProfiles™ and RealContours™.
  - RealContoursTM automates the production of noise contours directly from every individual radar trace. Approximately 401,483 traces were collected from the system and 363,563 retained enough information to be modeled in the RealContours TM system. Each radar trace was converted to an INM model track, ensuring that the lateral dispersion of radar tracks was retained in the modeling. The operations on these radar traces were then scaled to account for all of the 406,119 operations in 2006. This method also helps to develop more accurate noise contours by retaining the actual runway used and time of each operation.
  - RealProfilesTM analyzes each radar trace and develops altitude and performance profiles to be used by the model to ensure that the vertical dispersion of the radar tracks is retained in the modeling.
- **Use of radar data to determine the modeling profile for each of the 363,563 radar traces captured by Logan Airport's noise monitoring system.** A profile was developed for each flight track departing from and arriving to each runway end to assure that the altitude profiles represented as accurately as possible the aircraft's performance during arrival or departure. This technique has been used since the *2004 ESPR* and improves the accuracy of each aircraft's modeled altitude over surrounding communities.
- **Installation of an improved noise and operations monitoring system.** The installation contract for the system was signed in March 2005, and acceptance testing is expected in 2007.

All of these enhancements are examples of Massport's continued commitment to improving the monitoring, reporting, and understanding the noise environment at Logan Airport. The following section of this chapter summarizes the basic operational data used to compute the DNL, CNI, and TA noise metrics reported for 2006.

Noise Model Inputs

The FAA's INMv6.2a is the primary analytical tool used to assess the noise environment at Logan Airport. This is an updated version of the model that has been used since the *2002 EDR* for calculation of all noise contours at the Airport. It also includes provisions for over-water sound propagation and hill effects tailored to the local environment and approved by FAA's Office of Environment and Energy (AEE) based on previous special studies. Documentation of these features is included in earlier editions of EDRs and ESPRs.

The INM requires detailed operational data as inputs for its noise calculations, including numbers of operations per day by aircraft type and by time of day; which runway for each arrival and for each departure; and flight track geometry for each track. These data are summarized in tables which follow or are included in *Appendix H, Noise Abatement*.

For this *2006 EDR*, Massport is continuing to use the new pair of software packages known as RealProfiles™ and RealContours™. They incorporate INMv6.2a as the computational engine for calculating noise, but they operate on individual flight tracks taken directly from radar systems rather than on consolidated flight tracks used in reports prior to 2004. *Appendix H, Noise Abatement* provides a summary discussion of RealProfiles™ and RealContours™. The *2004 ESPR* described the software in detail, and evaluated the results with additional attention to detail sufficient to justify their use for subsequent ESPRs and EDRs.

INMv6.2a Improvements

INMv6.2a is the second release of the model since INMv6.1 was released. Each of the annual reports since 2002 has used INMv6.1. Much of the changes in the model focus on noise issues in the National Parks. The FAA, in cooperation with other agencies, has been working toward standardizing the database and updating it to reflect the current "in-service" fleet of aircraft. Twenty-one aircraft types were updated in the database in the version 6.2a release. Four aircraft were added to the database. These aircraft are non-jet aircraft, namely three small Piper aircraft and the Beechcraft 1900 commuter turboprop.

RealContours™ and RealProfiles™

This software incorporates the FAA-approved INMv6.2a as the computational engine for calculating noise, but provides greater detail through the uses of individual flight tracks taken directly from radar systems rather than relying on consolidated, representative flight tracks data.

RealContours™ improves the precision of modeling by:

- Directly converting the radar flight track for every identified aircraft operation to an INM track, rather than assigning all operations to a limited number of prototypical or representative tracks.
- Modeling each operation on the specific runway that it actually used, rather than applying a generalized distribution to broad ranges of aircraft types.

- Selecting the specific airframe and engine combination to model, on an operation-by-operation basis, based on the published composition of the fleets of the specific airlines operating at Logan Airport.
- Using each aircraft's actual performance and altitude profile to develop inputs to the model which define the actual arrival or departure profile

The following sections of this chapter provide an overview of the methodology and results. *Appendix H, Noise Abatement* provides greater detail on both.

RealContours™ and RealProfiles™ Methodology
Standard INM methodology involves development of operational inputs and calculation of the DNL for a prototypical average annual day. This approach requires manually collecting, refining, and entering the enormous amount of data related to a full year of activity at an airport. For example, the model inputs may include an aircraft fleet mix with several dozen representative aircraft types, numerous representative flight tracks (on the order of 100 to 300 is common for an airport comparable to Logan Airport), and runway use and flight track use percentages for three or four categories of aircraft types with similar performance characteristics. These data are compiled and processed to determine annual average day input for the INM. The model then uses these input data to produce annual average day noise exposure contours and supplemental metrics.

Although the standard INM approach meets accepted professional standards, and reduces the effort and cost that would be associated with manually entering the parameters for every actual operation, it represents a significant simplification of the diversity of actual aircraft operations over a year. In addition, it does not take full advantage of the investment that Massport has made in installing and maintaining a state-of-the-art radar system,[3] which automatically collects flight track data and flight identification data for all operations at the Airport.

In contrast, RealProfiles™ and RealContours™ use each radar trace captured by Massport's noise monitoring system to compute noise exposure levels, population counts, and other indicators of the Logan Airport noise environment. RealContours™ uses INM to produce computations for each day of radar data and then compiles annual average noise exposure contours and supplemental metrics from each of the 363 days[4] of computations.

The remaining section summarizes the average-day operations for 2006 used in the noise modeling and compares them to similar data for 2005.

Fleet Mix

Beginning in 2001, significant improvements in radar data processing and analysis capabilities allowed Massport to rely more heavily on radar data as the primary source of input for noise calculations. Radar data typically are more accurate than the information reported by air carriers. These radar data typically result in a list of approximately 500 different aircraft types that use Logan Airport during a year, including the wide variety of small corporate jets and propeller aircraft flown by GA users, as well as the large passenger and cargo jets operated by air carriers.

For 2006, aircraft types at Logan Airport were matched to the INMv6.2a database, which contains individual noise and performance profiles for 252 different aircraft types, 137 of which represent civilian aircraft, the

3 The Massport system utilizes the PASSUR™ product of Megadata Corporation and the data is processed using PREFlight™ from HMMH.

4 The PASSUR system supplied 363 days of useable radar data. The other 2 days were excluded due to a data failure. All modeling was adjusted to reflect 365 days.

balance being military aircraft.[5] For those types showing up in radar data that are not in the INM's database, the radar type is paired with the best available alternative using a standard FAA-approved substitution list. The final list of modeled aircraft, used as an input to the INM, is presented in detail in *Appendix H, Noise Abatement*.

As in the past, operations by aircraft types have been summarized into several key categories: Commercial (passenger and cargo) operations, Stage 2 or Stage 3 jet aircraft, and turboprop and propeller (non-jet) aircraft. In addition, the operations are split into daytime and nighttime periods, where nighttime hours are defined as 10:00 PM to 7:00 AM, consistent with the definition of DNL. Table 6-1 summarizes the numbers of operations by categories of aircraft operating at Logan Airport in 2006 and includes similar data for 2005 and earlier years for comparison.[6] Descriptions of Stage 2 and Stage 3 jet aircraft and nighttime operations follow the table.

Commercial Operations

Compared to 2005, the operations counts from Table 6-1 indicate a decrease in air carrier activity, with overall commercial traffic decreasing by 0.5 percent in 2006. Modeled conventional air carrier jets (as opposed to regional jets, also known as RJs) decreased by 2.4 percent, while modeled commercial non-jet activity decreased by 5.1 percent and modeled RJ operations increased by 6.0 percent. Overall operations in 2006, however, remain well below historic peaks.

General Aviation Operations

Modeled GA activity exhibited a nearly 3.7 percent decrease, from more than 89 daily operations in 2005 to just over 86 daily operations in 2006. Use of Stage 2 jets decreased almost 19 percent with a small decrease in Stage 3 jets. Non-jet activity in 2006 was 12.3 percent less than in 2005. Nighttime operations (between 10:00 PM and 7:00 AM) in 2006 decreased 3.7 percent from 2005. The number of nighttime arrivals and departures decreased from 131 per night in 2005 to 126 per night in 2006. These nighttime operations accounted for 11.3 percent of all aircraft operations at Logan Airport. On average, the majority of nighttime operations occurred in the shoulder hours either before midnight (39 percent of night operations) or after 5:00 AM (43 percent of night operations). On average, 18 percent of night operations occurred during late night hours between midnight and 5:00 AM.

5 Some of these are military types as well as older Stage 1 and 2 airplanes that no longer operate in the U.S. or do not use Logan Airport.
6 Table 6-1 and subsequent tables include data back to 1990. Data from 1991 are not available.

Table 6-1 Modeled Daily Operations by Commercial and General Aviation Aircraft[1]

		1990	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Commercial Aircraft																	
Stage 2 Jets[2]	Day	312.40	228.89	203.34	189.40	156.90	132.40	108.46	84.93	83.30	5.13	1.18	0.05	0.08	0.03	0.05	0.03
	Night	19.99	13.13	7.44	10.10	5.50	4.79	7.75	5.92	6.66	0.26	0.05	0.00	0.00	0.01	0.01	0.00
	Totals	**332.39**	**242.02**	**210.78**	**199.50**	**162.40**	**137.19**	**116.21**	**90.85**	**89.96**	**5.39**	**1.23**	**0.05**	**0.08**	**0.05**	**0.06**	**0.03**
Stage 3 Jets (All)	Day	288.89	384.49	418.99	425.70	429.40	439.81	505.08	541.43	597.28	727.09	756.24	740.75	717.85	772.39	765.76	767.55
	Night	57.25	58.29	65.47	62.80	69.00	80.16	85.06	95.54	98.59	103.66	109.77	97.04	92.69	113.24	113.66	114.81
	Totals	**346.14**	**442.78**	**484.46**	**488.50**	**498.40**	**519.97**	**590.14**	**636.97**	**695.87**	**830.75**	**866.01**	**837.79**	**810.54**	**885.63**	**879.42**	**882.36**
Conventional Jets	Day	NA[3]	NA[3]	NA[3]	NA[3]	NA[3]	NA[3]	NA[3]	NA[3]	569.18	648.95	569.99	500.70	461.06	518.96	505.48	490.63
	Night	NA[3]	NA[3]	NA[3]	NA[3]	NA[3]	NA[3]	NA[3]	NA[3]	96.21	99.79	101.30	83.52	72.69	89.24	91.99	92.71
	Totals	NA[3]	NA[3]	NA[3]	NA[3]	NA[3]	NA[3]	NA[3]	NA[3]	**665.39**	**748.74**	**671.29**	**584.22**	**533.75**	**608.20**	**597.47**	**583.34**
Regional Jets	Day	NA[3]	NA[3]	NA[3]	NA[3]	NA[3]	NA[3]	NA[3]	NA[3]	28.10	78.14	186.25	240.05	256.80	253.43	260.34	276.95
	Night	NA[3]	NA[3]	NA[3]	NA[3]	NA[3]	NA[3]	NA[3]	NA[3]	2.38	3.87	8.47	13.52	19.99	24.00	21.68	22.11
	Totals	NA[3]	NA[3]	NA[3]	NA[3]	NA[3]	NA[3]	NA[3]	NA[3]	**30.48**	**82.01**	**194.72**	**253.57**	**276.79**	**277.43**	**282.01**	**299.06**
Non-Jet Aircraft	Day	444.41	411.84	598.16	541.97	526.85	505.31	514.70	552.56	448.82	409.62	317.62	165.45	135.18	133.24	148.77	140.81
	Night	11.72	69.32	46.84	13.59	11.14	13.73	27.27	21.86	16.63	21.58	10.97	3.45	2.41	3.03	3.02	3.26
	Total	**456.13**	**481.16**	**645.00**	**555.56**	**537.99**	**519.04**	**541.97**	**574.42**	**465.45**	**431.20**	**328.58**	**168.89**	**137.59**	**136.28**	**151.79**	**144.07**
Total Commercial Operations	Day	1045.70	1025.22	1220.49	1157.07	1113.15	1077.52	1128.24	1178.92	1129.90	1141.84	1075.04	906.25	853.10	905.66	914.59	908.41
	Night	88.96	140.74	119.75	86.49	85.64	98.68	120.08	123.32	121.88	125.51	120.79	100.49	95.10	116.29	116.68	118.09
	Total	**1134.66**	**1165.96**	**1340.24**	**1243.56**	**1198.79**	**1176.20**	**1248.32**	**1302.24**	**1251.78**	**1267.35**	**1195.82**	**1006.73**	**948.20**	**1021.95**	**1031.27**	**1026.51**
GA Aircraft																	
Stage 2 Jets[2]	Day	Day	NA[4]	NA[4]	NA[4]	NA[4]	NA[4]	NA[4]	NA[4]	5.25	9.89	7.29	5.15	3.65	2.84	0.94	2.29
	Night	Night	NA[4]	NA[4]	NA[4]	NA[4]	NA[4]	NA[4]	NA[4]	0.40	0.74	0.64	0.50	0.41	0.26	0.14	0.25
	Total	**Total**	NA[4]	NA[4]	NA[4]	NA[4]	NA[4]	NA[4]	NA[4]	**5.65**	**10.63**	**7.93**	**5.65**	**4.08**	**3.10**	**1.08**	**2.54**
Stage 3 Jets	Day	Day	NA[4]	NA[4]	NA[4]	NA[4]	NA[4]	NA[4]	NA[4]	30.54	48.46	40.08	34.23	37.83	46.21	53.72	58.84
	Night	Night	NA[4]	NA[4]	NA[4]	NA[4]	NA[4]	NA[4]	NA[4]	4.21	6.55	3.21	3.28	6.42	6.98	8.37	9.33
	Total	**Total**	NA[4]	NA[4]	NA[4]	NA[4]	NA[4]	NA[4]	NA[4]	**34.75**	**55.01**	**43.29**	**37.51**	**44.25**	**53.19**	**62.09**	**68.16**
Non-Jets	Day	Day	NA[4]	NA[4]	NA[4]	NA[4]	NA[4]	NA[4]	NA[4]	37.29	19.36	34.57	37.31	17.36	17.81	16.95	14.00
	Night	Night	NA[4]	NA[4]	NA[4]	NA[4]	NA[4]	NA[4]	NA[4]	16.28	18.89	1.83	1.92	4.45	4.40	5.20	4.75
	Total	**Total**	NA[4]	NA[4]	NA[4]	NA[4]	NA[4]	NA[4]	NA[4]	**53.57**	**38.25**	**36.40**	**39.23**	**21.81**	**22.21**	**22.14**	**18.75**
Total GA Operations	Day	Day	NA[4]	NA[4]	NA[4]	NA[4]	NA[4]	NA[4]	NA[4]	73.08	77.71	81.94	76.68	58.84	66.88	71.60	75.12
	Night	Night	NA[4]	NA[4]	NA[4]	NA[4]	NA[4]	NA[4]	NA[4]	20.89	26.17	5.68	5.71	11.29	11.64	13.71	14.33
	Total	**Total**	NA[4]	NA[4]	NA[4]	NA[4]	NA[4]	NA[4]	NA[4]	**93.97**	**103.88**	**87.62**	**82.39**	**70.13**	**78.52**	**85.31**	**89.46**
Total	Day	1045.70	1025.22	1220.49	1157.07	1113.15	1077.52	1128.24	1252.00	1207.61	1223.78	1151.72	965.09	919.98	977.27	989.71	986.43
	Night	88.96	140.74	119.75	86.49	85.64	98.68	120.08	144.21	148.05	131.19	126.50	111.78	106.74	130.00	131.02	126.21
	Total[3]	**1134.66**	**1165.96**	**1340.24**	**1243.56**	**1198.79**	**1176.20**	**1248.32**	**1396.21**	**1355.66**	**1354.97**	**1278.21**	**1076.86**	**1026.72**	**1107.26**	**1120.73**	**1112.66**

Source: Massport's Noise Monitoring System and Revenue Office numbers.
Note: Data from 1991 not available.
1 Includes scheduled and unscheduled operations.
2 Stage 2 aircraft are exempt from meeting newer federal Stage 3 noise limits when their maximum gross takeoff weight is less than or equal to 75,000 pounds.
3 Regional Jet operations were not tracked separately prior to 1999.
4 Totals prior to 1998 do not include GA operations.

Stage 2, Stage 3, and Stage 4 Jet Aircraft

Jet aircraft currently operating at Logan Airport are categorized by FAA into two groups: Stage 2 and Stage 3. As described previously, the designation refers to a noise classification specified in FAR Part 36 that sets noise emission standards at three measurement locations – takeoff, landing, and sideline – based on an aircraft's maximum certificated weight. The heavier the aircraft, the more noise it is permitted to make within limits.

The *Airport Noise and Capacity Act of 1990* (and its implementing regulations known as FAR Part 91), required operators of Stage 2 airplanes weighing more than 75,000 pounds to transition to Stage 3 aircraft through the phase out of the older, noisier airplanes by December 31, 1999. Stage 2 aircraft weighing less than or equal to 75,000 pounds (most of them used in GA or for small commercial activities such as transporting checks between Federal Reserve Banks) are exempt from the requirement and have continued to fly after the December 31, 1999 phase-out deadline.

Because of the substantial differences in noise between Stage 2, recertificated Stage 3, and new Stage 3 aircraft, Massport tracks operations by these separate categories to follow their trends. Table 6-2 shows the percentage of commercial jet operations by stage category since 1999. One of the most significant changes occurring after the economic downturn in 2001 was the almost immediate retirement of the recertificated aircraft from airlines' fleets due to their high operating costs. In 2006, the proportion of commercial jets recertificated as Stage 3 continued to drop, but by only six-tenths of 1 percent since 2005. The total decrease in recertificated operations since 2000 is almost 92 percent. Newly manufactured Stage 3 aircraft continue to increase as a percentage of the commercial jet fleet, accounting for 98.6 percent of the commercial jet fleet.

Table 6-2 Percentage of Commercial Jet Operations by Part 36 Stage Category

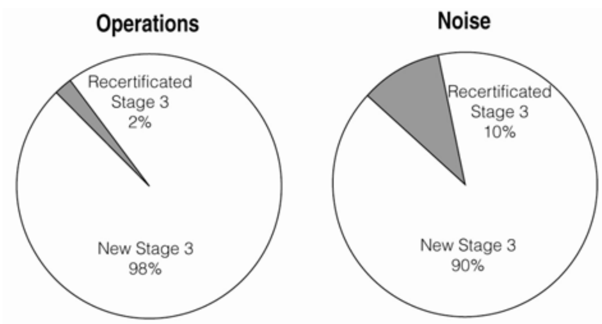
	New Stage 3[1]	Recertificated Stage 3[2]	Stage 2	Total
1999	70.0%	21.0%	9.0%	**100%**
2000	75.0%	24.0%	1.0%	**100%**
2001	86.3%	13.6%	0.1%	**100%**
2002	92.8%	7.2%	0.0%	**100%**
2003	95.8%	4.1%	0.01%	**100%**
2004	97.8%	2.2%	0.0%	**100%**
2005	98.0%	2.0%	0.0%	**100%**
2006	98.6%	1.4%	0.0%	**100%**

Source: Massport and FAA radar data.
1 New Stage 3 aircraft are aircraft originally manufactured as a certified Stage 3 aircraft under Federal Regulation Part 36.
2 Recertificated Stage 3 aircraft are aircraft originally manufactured as a certified Stage 1 or 2 aircraft under Federal Regulation Part 36 which have been either treated with hushkits or have been re-engined to meet Stage 3 requirements.

Stage 4 aircraft will be entering the airlines' fleets in the next decade. The new Stage 4 noise standard applies to any new aircraft type designs requiring FAA approval after January 1, 2006. These new aircraft will have to produce a combined improvement in noise emission levels of at least 10 dB below the current Stage 3 limits at the three Part 36 measurement locations.[7] The International Civil Aviation Organization (ICAO) has already adopted a similar regulation for international operators, but neither the FAA nor ICAO has indicated any movement towards restricting the remaining recertificated Stage 3 aircraft from carrier fleets.

The pie charts presented in Figure 6-1 show the relative contributions of these aircraft groups to total commercial operations at Logan Airport compared to their contribution to total noise. The comparison illustrates the stronger-than-average influence that recertificated aircraft have on noise exposure, accounting for 2 percent of the commercial jet operations but creating approximately 10 percent of the noise exposure.

Figure 6-1 Relative Contributions of Commercial Jet Operations and Noise at Logan Airport in 2006



Note: Noise calculations include the 10 dB nighttime penalty.
There are no Stage 2 commercial operations.

Nighttime Operations

Nighttime flights by commercial operators increased by 1 percent, from 116.7 per night in 2005 to 118.1 per night in 2006. This continues the small increase that Logan Airport has experienced over the past three years, although nighttime operations in 2006 were still below 2001 levels. The majority of nighttime operations (between 10:00 PM and 7:00 AM) occurred either before midnight (39 percent) or after 5:00 AM (42 percent). On average, only 19 percent of nighttime operations (25 operations) occurred during late night hours between midnight and 5:00 AM.

Although Stage 2 aircraft over 75,000 pounds have been banned since January 1, 2000, aircraft certified as Stage 2 which weigh less than 75,000 pounds have continued to operate in the U. S. Most Stage 2 aircraft involved in commercial operations in the U.S. fall into the category that has been banned. Stage 2 aircraft currently allowed to operate are small corporate jet size aircraft that are primarily in the GA fleet. However, there have been discussions regarding the development of a ban for these aircraft as well. Logan Airport's Noise Rules prohibit aircraft less than 75,000 pounds from using the Airport between the hours of 11:00 PM and 7:00 AM. Massport's noise monitoring system alerts Noise Office staff of potential violations when they occur.

In addition, Massport takes note of flights that operate between the broader DNL nighttime period of 10:00 PM to 7:00 AM, when each flight is penalized 10 dB in calculations of noise exposure. Table 6-3 shows this nighttime

7 Federal Aviation Administration, *14 CFR Parts 36 and 91: Stage 4 Aircraft Noise Standards; Final Rule.* Federal Register, Vol. 70, No. 127, July 5, 2005.

activity by different groups of aircraft. Although nighttime operations of commercial aircraft increased by about 1 percent from 2005 to 2006, there was a significant decrease (43 percent) in nighttime GA activity, resulting in a decrease in overall nighttime operations. These nighttime operations represent approximately 11 percent of total operations at Logan Airport.

Table 6-3 Modeled Nighttime Operations at Logan Airport

	Commercial Jets	Commercial Non-Jets	General Aviation[1]	Total
1990	77.24	11.72	NA	**88.96**
1991	NA[2]	NA[2]	NA[2]	**NA**[2]
1992	71.42	69.32	NA	**140.74**
1993	72.91	46.84	NA	**119.75**
1994	72.90	13.59	NA	**86.49**
1995	74.50	11.14	NA	**85.64**
1996	84.95	13.73	NA	**98.68**
1997	92.81	27.27	NA	**120.08**
1998	101.46	21.86	NA	**123.32**
1999	105.25	16.63	26.17	**148.05**
2000	103.92	21.58	5.68	**131.19**
2001	109.82	10.97	5.71	**126.50**
2002	97.04	3.45	11.29	**111.78**
2003	92.69	2.41	11.64	**106.74**
2004	113.26	3.03	13.73	**130.02**
2005	113.67	3.02	14.33	**131.02**
2006	114.83	3.26	8.12	**126.22**
Change (2005 to 2006)	**1.16**	**0.24**	**-6.21**	**-4.80**
Percent Change	**1.02%**	**7.95%**	**-113.12%**	**-3.66%**

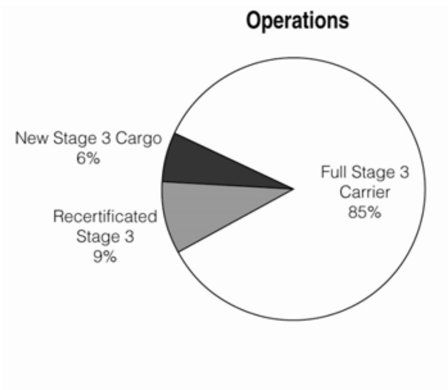
1 General aviation data not available prior to 1999.
2 1991 data not available.

Figure 6-2 breaks down the nighttime commercial activity by air carrier and cargo operators. It shows that recertificated cargo operations accounted for 9 percent of all nighttime operations in 2005, but because they are louder than newly manufactured Stage 3 aircraft, they contribute 13 percent of all nighttime noise by commercial operators. Other findings indicate:

- Although 9 percent of all night flights were flown by cargo operators using recertificated Stage 3 aircraft, those aircraft comprised 60 percent of the total nighttime operations flown by cargo operators during the year, a higher percentage of their fleet than that of passenger operators. In general, this is because the cargo fleet has a slower turn-over to newer, quieter aircraft, since cargo operators find it more cost-effective to retain their older and fully depreciated aircraft.
- In comparison, passenger airlines only flew 0.2 percent of total night operations in recertificated Stage 3 aircraft, and those flights comprised 0.3 percent of the total night flights by passenger operators; there are large numbers of new Stage 3 aircraft in the passenger aircraft fleets and they are deployed almost exclusively at night.

Though ICAO and the FAA are not expected to require the phase out of the remaining recertificated operations still so prevalent among cargo operators, the use of these aircraft will decline in the future due to age. In the interim, Massport encourages and supports individual operators' voluntary efforts to undertake fleet conversions that eliminate recertificated aircraft.

Figure 6-2 Recertificated vs. New Stage 3 Commercial Nighttime Operations (2006)



Note: Includes both jet and non-jet.
Stage 2 Day and Night operations contribute less than 1 percent of operations and noise.
Noise calculations include the 10 dB nighttime penalty.

Runway Use

Logan Airport's runways are shown in Figure 6-3. Runway use refers to the frequency with which aircraft utilize each of these runways during the course of the year, as dictated or permitted by availability, wind, weather, aircraft performance, demand, air traffic control conditions, and Preferential Runway Advisory System (PRAS) considerations. PRAS is a computer program that recommends to the FAA air traffic controllers, runway configuration options that will meet weather and demand requirements and provide an equitable distribution of the Airport's noise impacts on the surrounding communities. The more often a runway is used the greater the noise exposure in the communities adjacent to the end of the runway. Runway use conditions in 2006 were as follows:

- Runway 14-32 opened in late November, 2006. The runway was used, as planned, primarily for arrivals of regional jets and turboprops over Boston Harbor.
- The automated PRAS system was interrupted in February of 2004 and remained down for all of 2005 and 2006 to allow replacement of the previous Automated Radar Terminal System (ARTS) radar with FAA's new Standard Terminal Automation Replacement System (STARS) radar and the consolidation of the Boston Terminal Radar Approach Control (TRACON) at the new facility in Merrimack, NH. The PRAS is a computer program that recommends runway configuration options that will meet weather and demand requirements while attempting to provide an equitable distribution of the Airport's noise impacts on surrounding communities. The new PRAS system was installed in late 2006 and is expected to be operational in 2007.
- The runway use indicates high use of the parallel Runways (22L-4R and 22R-4L) and a shifting of heavy jets from Runway 15L-33R to Runway 22L-4R.

Figure 6-3 Logan Airport Runways

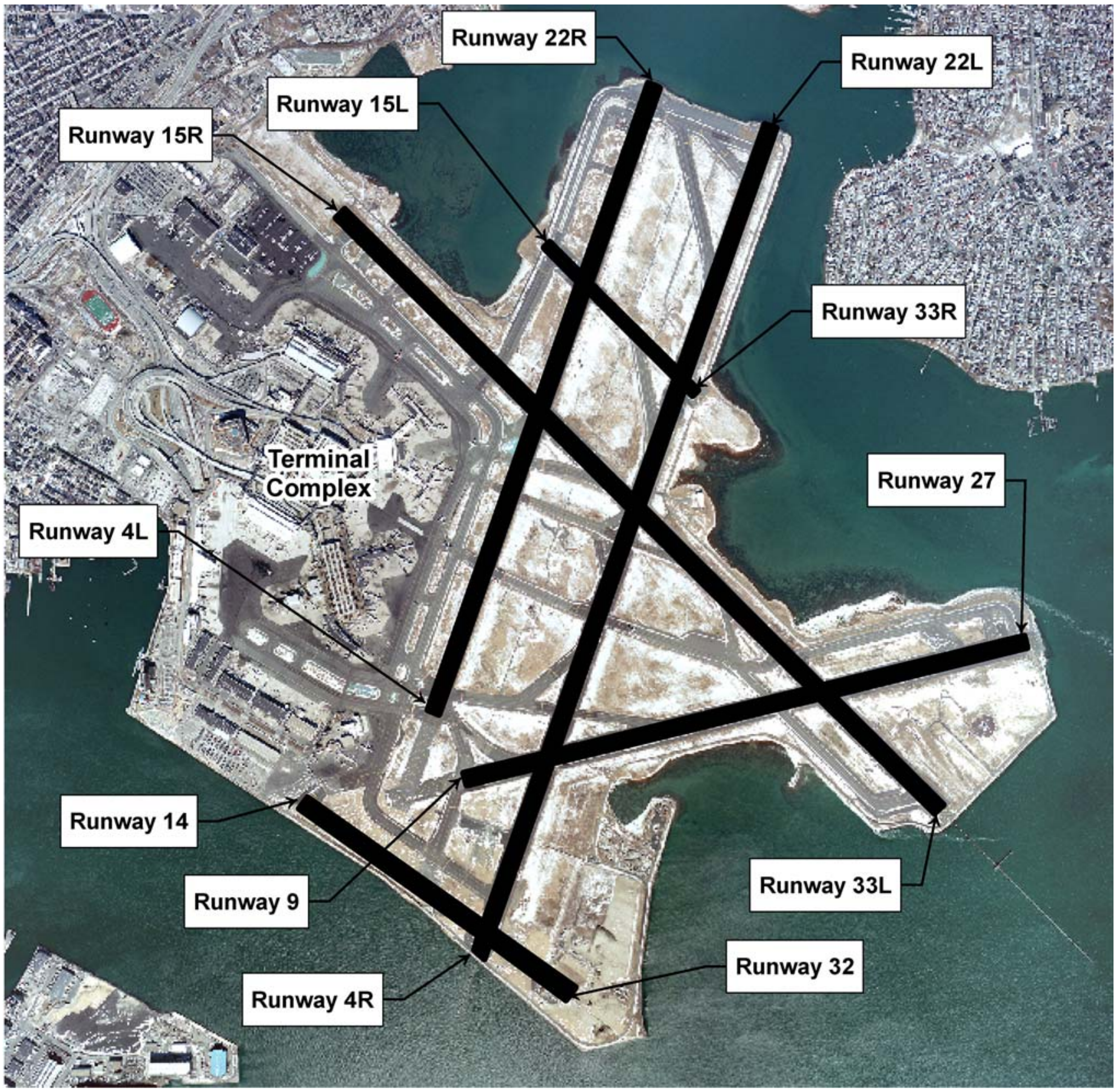


Table 6-4 presents consolidated runway use by jets. Since 2001, the radar data have been analyzed with Massport's PreFlight software. PreFlight is an analysis package used to assist in compiling fleet, day/night splits, and runway use information from radar data. Earlier data were derived from Massport's original noise monitoring system, supplemented with field records.

Table 6-4 Summary of Jet Aircraft Runway Use

	Runway									
	4L	4R	9	14[1]	15R	22L	22R	27	32[1]	33L
1990										
Departures	0%[2]	3%	21%	NA	10%	2%	36%	20%	NA	7%
Arrivals	1%	25%	0%	NA	2%	14%	0%	28%	NA	29%
1992[2]										
Departures	0%	6%	31%	NA	7%	2%	38%	10%	NA	6%
Arrivals	1%	37%	0%	NA	3%	12%	0%	30%	NA	17%
1993										
Departures	0%	9%	33%	NA	7%	3%	40%	4%	NA	4%
Arrivals	2%	44%	0%	NA	1%	11%	0%	28%	NA	15%
1994										
Departures	0%	9%	33%	NA	4%	3%	32%	12%	NA	5%
Arrivals	3%	42%	0%	NA	1%	8%	0%	27%	NA	19%
1995										
Departures	0%	8%	36%	NA	5%	5%	29%	11%	NA	5%
Arrivals	3%	41%	0%	NA	2%	8%	0%	27%	NA	17%
1996										
Departures	0%	8%	32%	NA	5%	6%	33%	12%	NA	5%
Arrivals	2%	38%	0%	NA	2%	11%	0%	29%	NA	18%
1997										
Departures	0%	8%	30%	NA	5%	6%	31%	15%	NA	5%
Arrivals	2%	36%	0%	NA	2%	9%	0%	30%	NA	20%
1998										
Departures	0%	8%	35%	NA	6%	5%	28%	14%	NA	5%
Arrivals	2%	41%	0%	NA	2%	7%	0%	28%	NA	19%
1999										
Departures	0%	8%	31%	NA	5%	4%	30%	15%	NA	6%
Arrivals	3%	37%	0%	NA	2%	10%	0%	28%	NA	21%
2000										
Departures	0%	8%	35%	NA	4%	3%	30%	15%	NA	6%
Arrivals	4%	50%	0%	NA	1%	7%	0%	28%	NA	20%

Table 6-4 Summary of Jet Aircraft Runway Use (Continued)

	Runway									
	4L	4R	9	14[1]	15R	22L	22R	27	32[1]	33L
2001										
Departures	0%	7%	34%	NA	4%	3%	35%	12%	NA	5%
Arrivals	5%	36%	0%	NA	1%	8%	0%	32%	NA	18%
2002										
Departures	0%	4%	31%	NA	6%	3%	35%	16%	NA	6%
Arrivals	6%	31%	0%	NA	1%	12%	0%	30%	NA	21%
2003										
Departures	0%	4%	33%	NA	7%	2%	34%	14%	NA	6%
Arrivals	7%	33%	0%	NA	1%	14%	0%	28%	NA	18%
2004										
Departures	0%	5%	34%	NA	10%	4%	24%	18%	NA	6%
Arrivals	6%	34%	0%	NA	1%	12%	0%	24%	NA	23%
2005										
Departures	0%	5%	36%	NA	7%	1%	31%	13%	NA	7%
Arrivals	8%	33%	0%	NA	1%	11%	0%	29%	0%	17%
2006										
Departures	0%	4%	33%	0%	3%	1%	40%	13%	-	6%
Arrivals	7%	29%	0%	-	1%	14%	0%	33%	0.2%	16%

Source: Massport Noise Office.
Notes: The data reflect actual percentages of jet aircraft operations on each runway end. They should not be confused with effective runway use which is used by the PRAS to derive recommendations for use of a particular runway. Effective runway percentages include a factor of 10 applied to nighttime operations so that use of a runway at night more closely reflects its effect on total noise exposure.
Jet aircraft are not able to use Runway 15L or 33R due to its length of only 2,557 feet.
Values may not add to 100 percent due to rounding.
1 Runway 14-32 opened in late November, 2006. (Runway 14-32 is unidirectional with no arrivals to Runway 14 and no departures from Runway 32).
2 1991 data are not available. The *1990 Final Generic Environmental Impact Report* was published and submitted to the Secretary of Environmental Affairs in July 1993. It included modeled operations and resulting noise contours for 1987, 1990, and a 1996 forecast year. The *1993 Annual Update* published in July 1994 included operations and contours for 1992 and 1993. 1991 data are not available.
NA Runway was not available.

Jet runway utilizations for 2006 remained generally similar to those of the previous year, but with some differences at several runway ends. Most significantly, departures on Runway 22R increased to 40 percent in 2006 from 31 percent in 2005. Use of Runway 22R for departures was reduced in 2005 and 2006 due to various airfield construction projects.

Other runway use changes included Runway 27 arrivals increasing from 29 percent in 2005 to 33 percent in 2006 and Runway 15R departures decreasing from 7 percent in 2005 to 3 percent in 2006. In addition, arrivals on Runway 22L increased from 11 percent to 14 percent between 2005 and 2006.

Preferential Runway Advisory System

Developed in 1982 and enhanced in 1990 and subsequent years, the PRAS is a computer program that recommends to the FAA air traffic controllers runway configuration options that will meet weather and demand requirements and provide an equitable distribution of the Airport's noise impacts on the surrounding communities. The primary objectives of the PRAS are to distribute noise in accordance with annual runway utilization goals, and to provide short-term relief from continuous operations over the same neighborhoods at the ends of the runways.

PRAS Compliance

Under the PRAS, each runway end has a specific annual utilization goal, defined separately for departures and arrivals. The goals are defined in terms of effective usage, which applies a factor of 10 to nighttime (10:00 PM to 7:00 AM) operations, equivalent to increasing nighttime exposure by 10 dB so that a change in effective utilization is roughly proportional to the change in DNL.

The PRAS computer was disabled in February 2004. This shutdown was necessary to accommodate the replacement of the previous ARTS radar at Logan Airport with the FAA's new STARS radar and the consolidation of the Boston TRACON at the new facility in Merrimack, NH. Although the PRAS has not been operational since that time, FAA air traffic controllers appear generally to have used the various runway configurations under similar situations that they would have with the PRAS.

Table 6-5 provides a comparison of effective runway use in 2006 to that of 2005, and to the PRAS goals. The 2006 utilizations shown in bold indicate improvements toward the goals for all runways. The effective jet runway use has not made much progress toward the PRAS goals in 2005 and 2006 mainly due to weather conditions, and construction and maintenance of the runway and taxiway system at Logan Airport.

Departures from Runway 15R decreased from 11.5 percent in 2005 to 4.8 percent in 2006 and were well below the goal of 23.3 percent. Arrivals to Runway 33L decreased also, from 24.0 percent in 2005 to 22.1 percent in 2006.

Table 6-5 Effective Jet Aircraft Runway Use in Comparison to PRAS Goals

	PRAS Effective Usage Goals		2005 Effective Usage		2006 Effective Usage	
Runway End	**Arrivals**	**Departures**	**Arrivals**	**Departures**	**Arrivals**	**Departures**
4R/L	21.1%	5.6%	33.8%	4.4%	**31.8%**	Z3.8%
9	0.0%	13.3%	0.0%	31.5%	0.0%	**30.3%**
15R	8.4%	23.3%	1.2%	11.5%	1.0%	4.8%
22L/R	6.5%	28.0%	14.0%	31.8%	15.5%	41.7%
27	21.7%	17.9%	26.8%	14.0%	29.6%	13.6%
33L	42.3%	11.9%	24.0%	6.8%	22.1%	5.8%

Notes: PRAS goals are stated in terms of effective jet operations which exclude non-jet flights, but which multiply each nighttime (10:00 PM to 7:00 AM) operation by a factor of 10.
Because there are no established runway usage goals for Runways 14 and 32, Runway 14 departures were added to Runway 15R and Runway 32 arrivals were added to Runway 33L for analysis purposes.

Flight Tracks

From 1997 through 2001, Massport used a consistent set of 156 modeled flight tracks to represent prototypical flight corridors. Those tracks are documented in the *2001 EDR* and earlier Logan Airport annual reports. In 2002, the noise analysis expanded the number of tracks to 1,847 based on a full year of radar data. That process was documented in the *2002 EDR*.

Starting in 2004, the software package RealContours™ was used develop the INM inputs. The new systems use every available radar track, which has suitable data, for modeling. This allows Massport to take into account runway closures and/or temporary airspace changes. Instead of using representative model tracks, RealContours™ converts each radar track to an INM model track and then models the scaled operation on that track. This method provides a one-to-one correspondence of radar tracks to model tracks and ensures that the lateral and vertical dispersion of aircraft types are consistent with the radar data.

Figure 6-4 provides a comparison of aircraft arrival profiles using RealProfiles™ with the standard 3-degree approach used in the INM. The magenta line is the 3-degree approach altitude profile and the other colored lines represent different jet aircraft types which were arriving on Runway 33L during early morning hours.

For this report, 363,563 tracks were modeled to calculate the noise levels surrounding Logan Airport. Figures 6-5 through 6-10 provide a representative sample (all operations during December 2006) of flight tracks used with RealContours™ to develop the 2006 contours. The figures show arrivals and departures separately for each of three aircraft categories: air carrier jets, regional jets, and non-jets.

Figures 6-8 and 6-10, which display modeled arrivals for regional jets and non-jets during December 2006, show flight tracks utilizing the new Runway 14-32.

Meteorological Data

The INM has several settings that affect aircraft performance profiles and sound propagation based on meteorological data. Meteorological settings include average annual temperature, barometric pressure, and relative humidity at the Airport. Massport obtained weather data for 2006 from the National Climatic Data Center (NCDC). Based on analysis of the NCDC data, the average annual conditions for 2006 are a temperature of 53.5 degrees Fahrenheit, sea level pressure of 31.42 in-Hg, and relative humidity of 66.2 percent. These values were used in the development of the 2006 noise conditions.

Figure 6-4 Modeled Arrival Profiles to Runway 33L

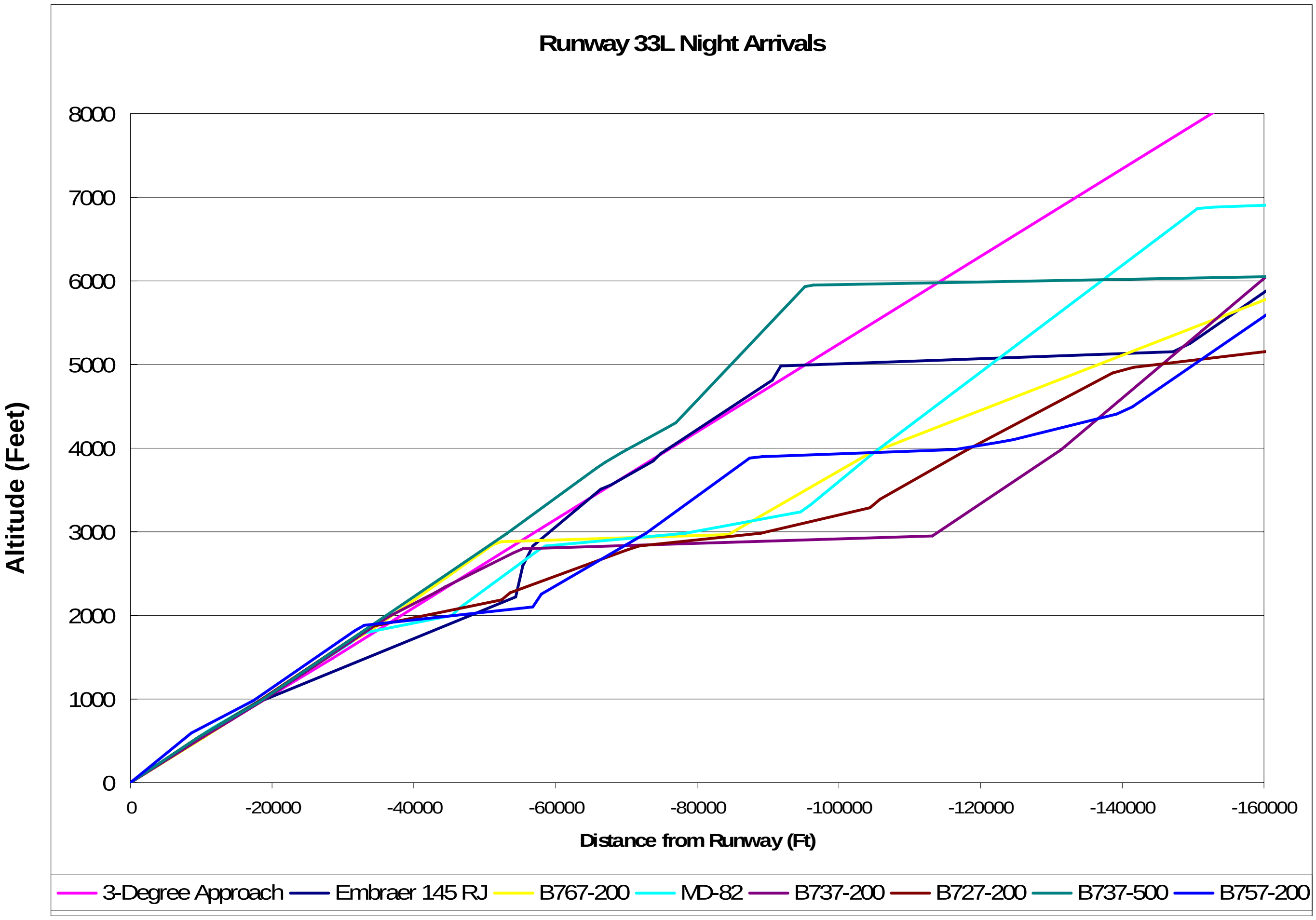


Figure 6-5 Air Carrier - RealContours™ Departure Flight Tracks (December 2006)

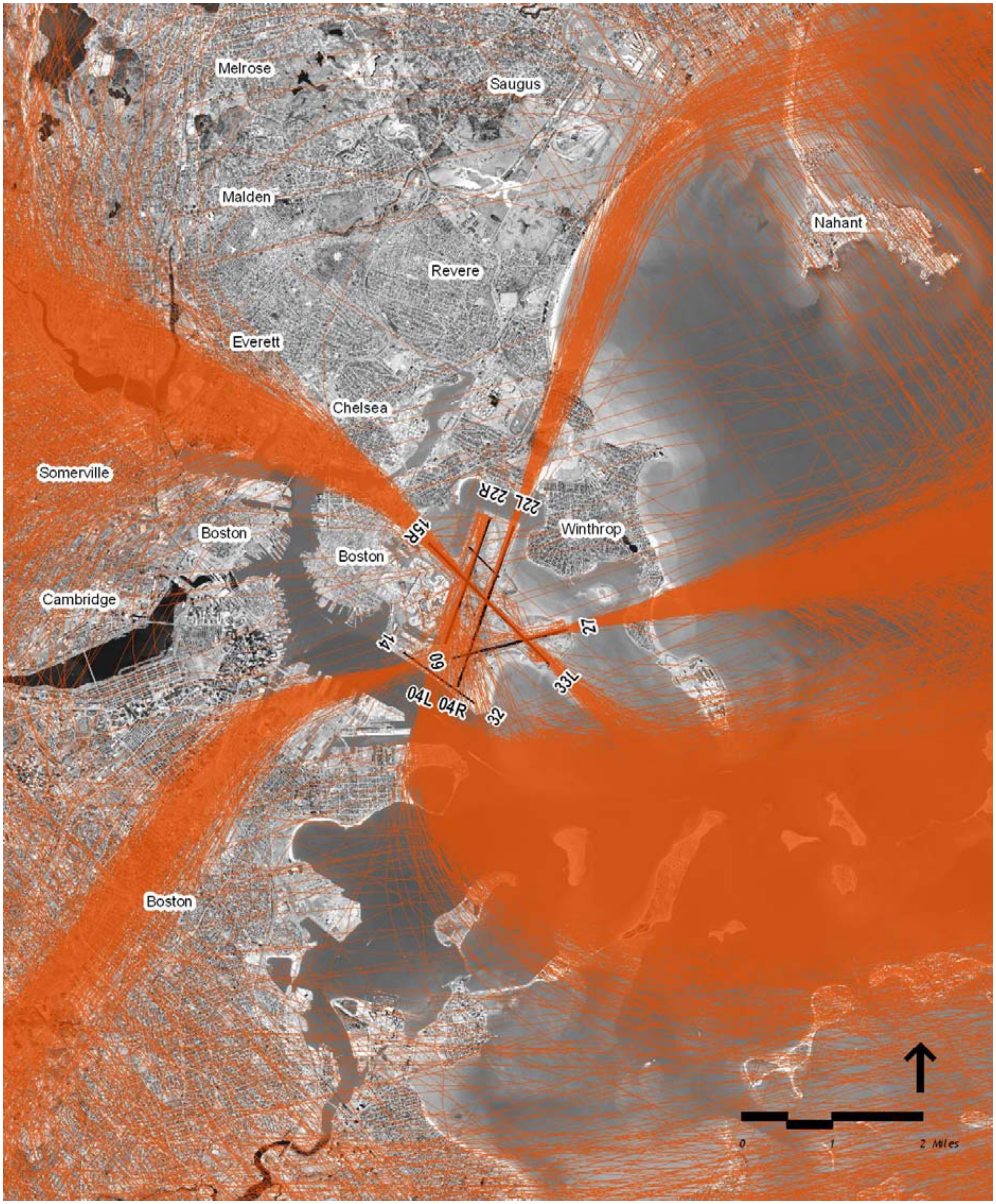


Figure 6-6 Air Carrier - RealContours™ Arrival Flight Tracks (December 2006)

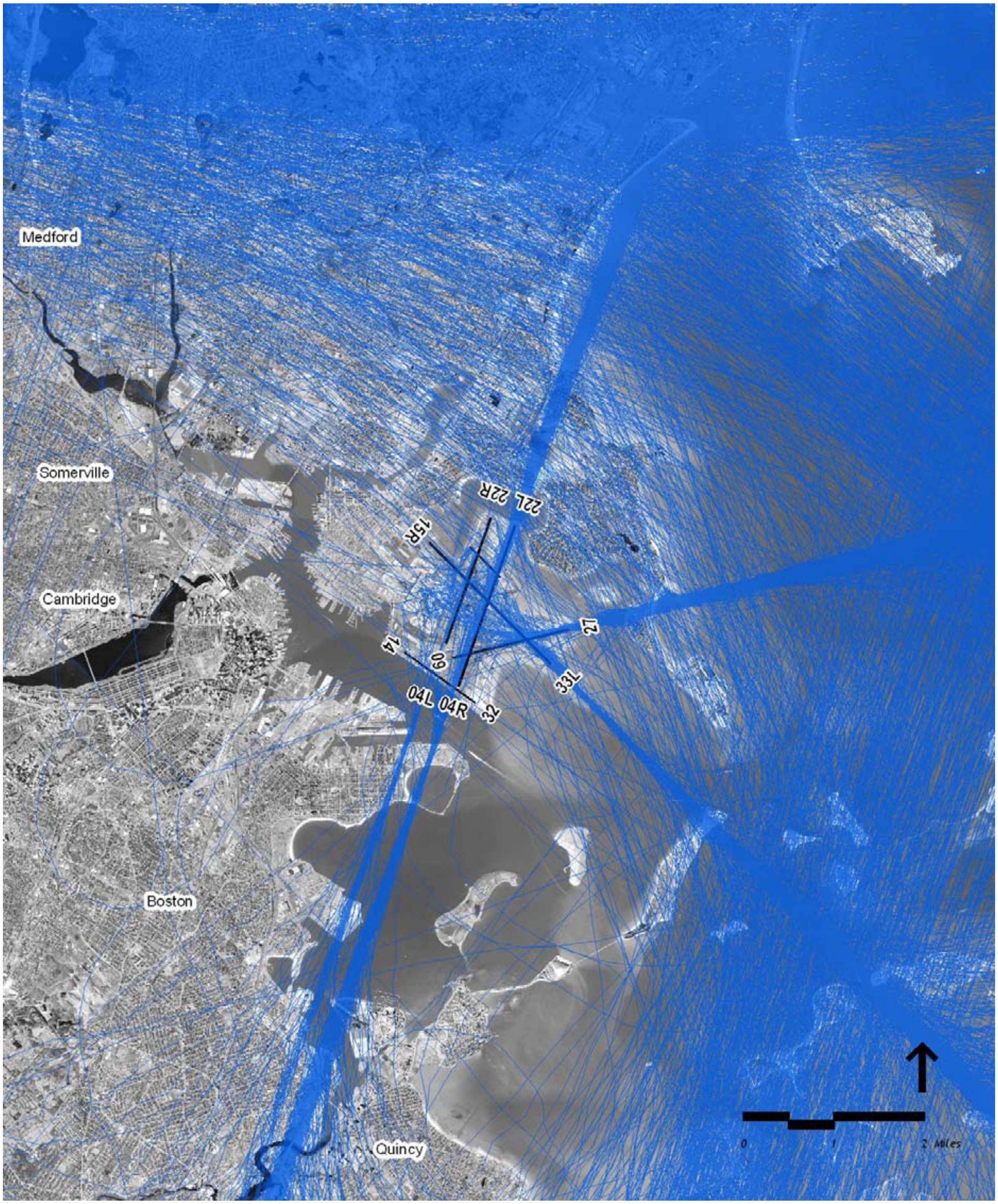


Figure 6-7 Regional Jet - RealContours™ Departure Flight Tracks (December 2006)

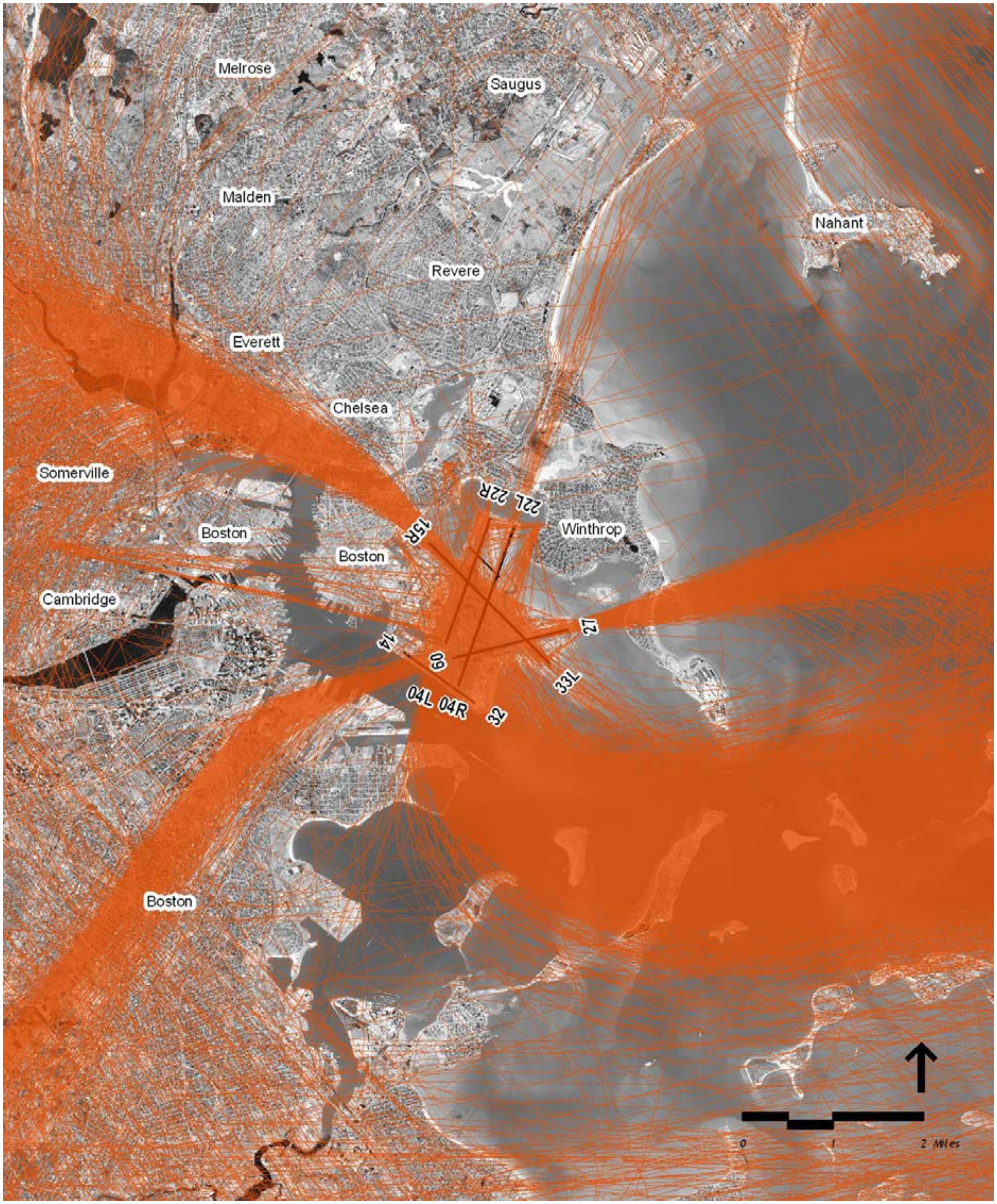


Figure 6-8 Regional Jet - RealContours™ Arrival Flight Tracks (December 2006)

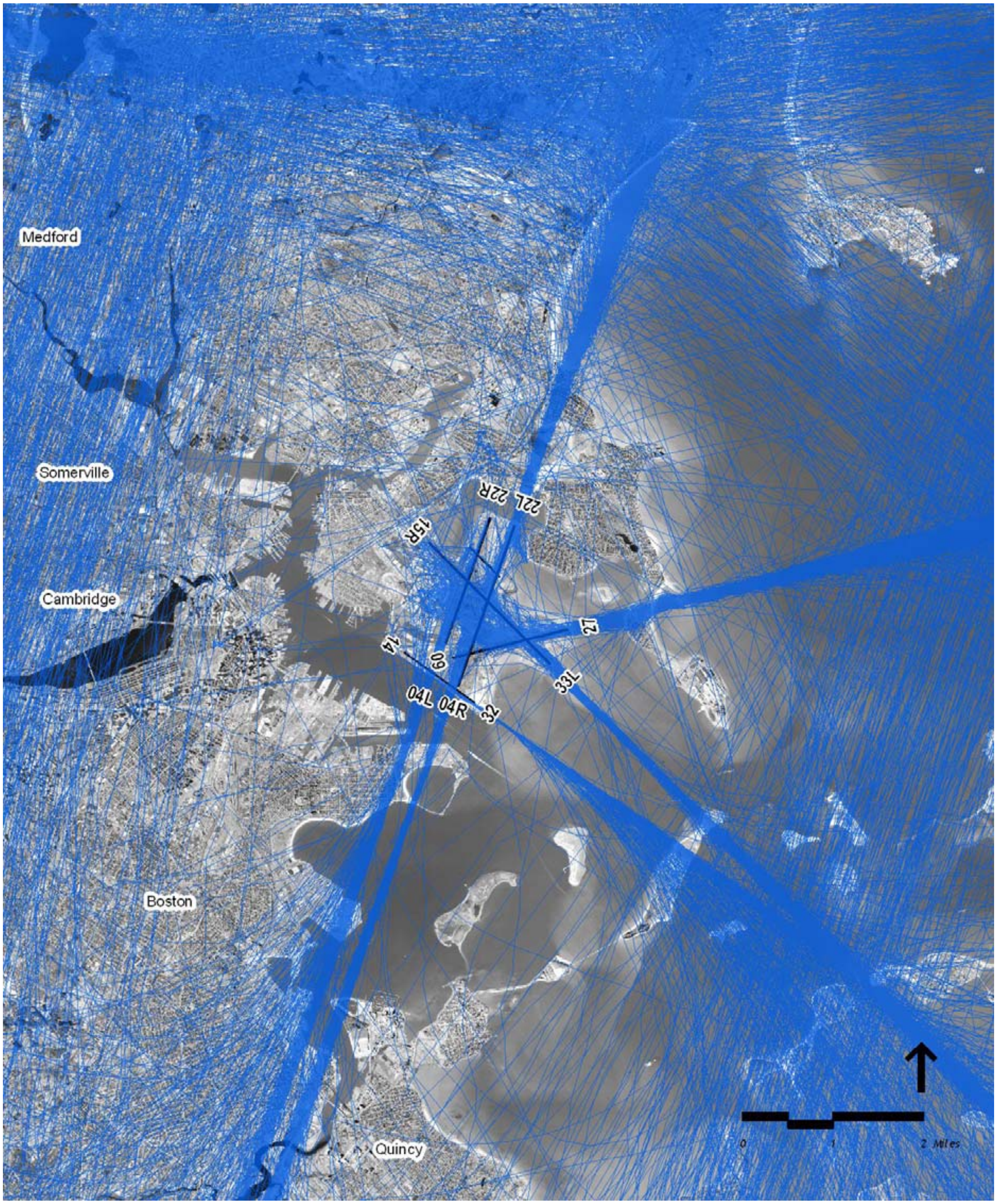


Figure 6-9 Non Jet - RealContours™ Departure Flight Tracks (December 2006)

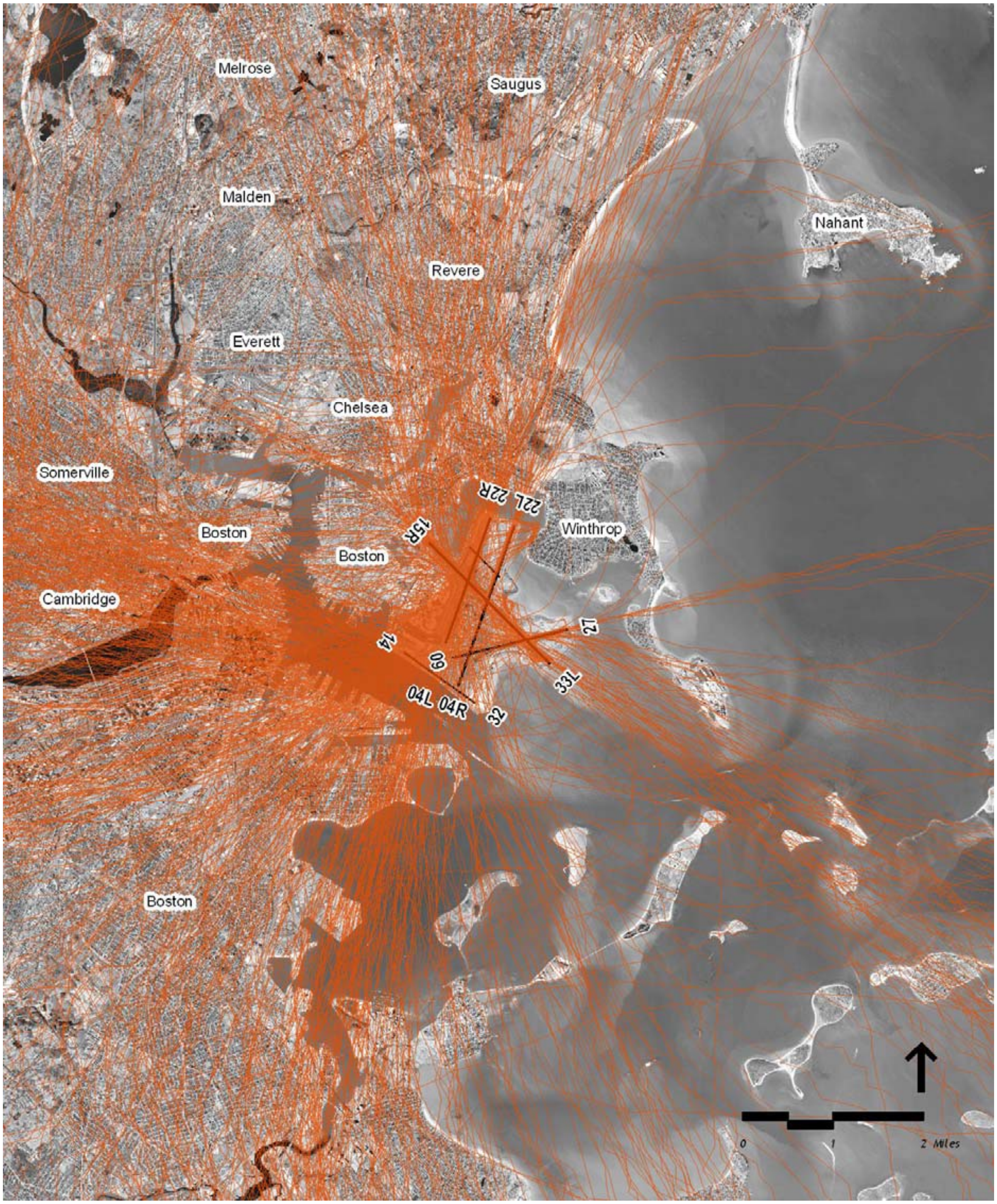
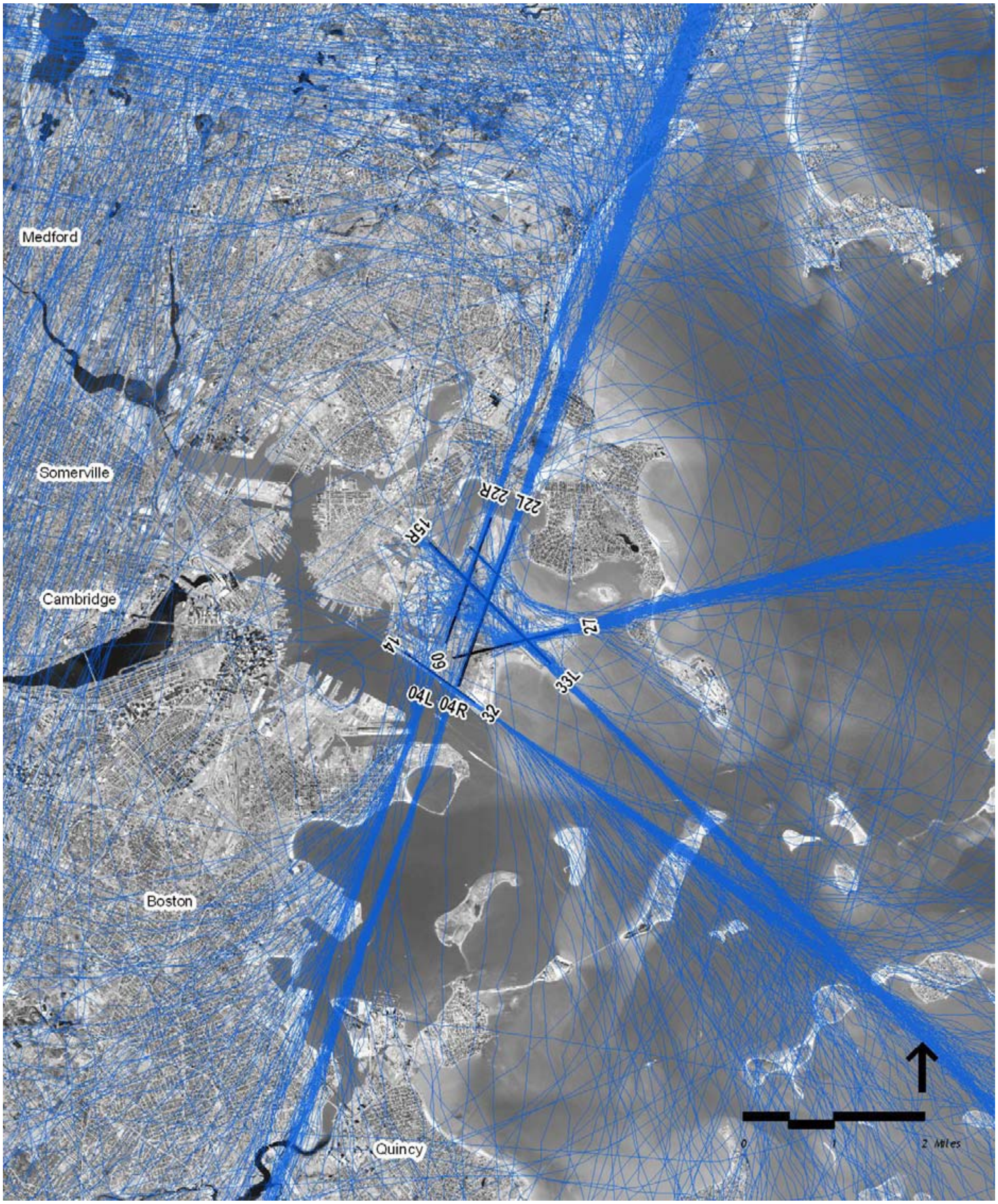


Figure 6-10 Non Jet - RealContours™ Arrival Flight Tracks (December 2006)



2006 Noise Levels

Day-Night Noise Contours for 2006

The 2006 and 2005 contours were prepared using FAA's INMv6.1. Both contour sets include the FAA-approved adjustments to account for over-water sound propagation and hill effects in Orient Heights that are unique to Logan Airport. The 2006 operations data presented earlier in this chapter and in *Appendix H, Noise Abatement*, provide the basic operational information used in modeling noise at Logan Airport. Figure 6-11 presents the resulting DNL contours for 2006 operations, shown in 5 dB increments of exposure for DNL values of 60, 65, 70, and 75 dB. Figure 6-12 compares the 65 dB DNL contour for 2006 to the 65 dB DNL contour for 2005 operations.

Massport has also prepared an updated 2006 contour using the most recent version of the INM (version 6.2a). Figure 6-13 compares the 2006 INMv6.1 and INMv6.2a contour sets. The INMv6.2a contour is virtually the same as the INMv6.1 contour, except for the ends of the contour affected by aircraft arrival noise. The contour along the Runway 4R-22L extended centerlines (towards Quincy and Revere), along the Runway 33L centerline (toward Hull), and Runway 27 centerline (toward Winthrop) is smaller due to database changes in INMv6.2a.

The changes in the noise exposure around Logan Airport for 2006 compared to 2005 were due to changes in operations and runway use. Total annual aircraft operations (arrivals and departures) at Logan Airport decreased compared to the previous year. Maintenance of the parallel runways and closures due to the construction of Runway 14-32 and the associated taxiways were the primary causes of changes in runway use during 2005 and 2006. These changes contributed to a decrease in departures from Runway 9 and a corresponding increase in use of Runway 22R for departures.

The comparison in Figure 6-12 shows a reduction in noise exposure over East Boston caused by the decrease in aircraft departing on Runway 15R and a decrease in heavy jet arrivals to Runway 15R at night. Increases in noise exposure are visible in parts of East Boston and over Boston Harbor due to the increase in Runway 22R departures. Additional arrivals on Runway 22L increased noise exposure along the runway's extended centerline in the direction of Revere. Despite these changes, the 65 dB DNL contour within populated areas covered only areas already sound insulated by Massport.

Noise exposure in portions of South Boston and the South Shore affected by arrivals on Runways 4L and 4R increased slightly compared to 2005 levels. Likewise, noise exposure in areas to the north affected by arrivals on Runway 22L and departures on Runway 4R, including East Boston, Winthrop, and Revere, also increased when compared to 2005 conditions.

Population Impact Assessment

Population counts within selected 5 dB increments of exposure are reported each year to indicate how the impact of Logan Airport's noise environment changes over time from neighborhood to neighborhood. Population counts for 2006 are shown in Table 6-6 by community and are compared to previous years. Population counts since 2001 are based on US Census data for 2000. Counts shown for 1999 and earlier are based on Census data for 1990. Population counts for 2000 are presented using both census periods, as were presented in previous *EDRs*. Both the FAA and the US Department of Housing and Urban Development consider DNL exposure levels above 65 dB to be incompatible with residential land use. Table 6-6 compares impacted populations each year, using the latest INM results. The noise analysis is always based upon the most recently FAA-approved INM. Table 6-7 provides an additional breakdown of the estimated population in East and South Boston residing within the 65 dB DNL contour.

Figure 6-11 INMv6.1- 60-75 dB DNL Contours for 2006 Operations

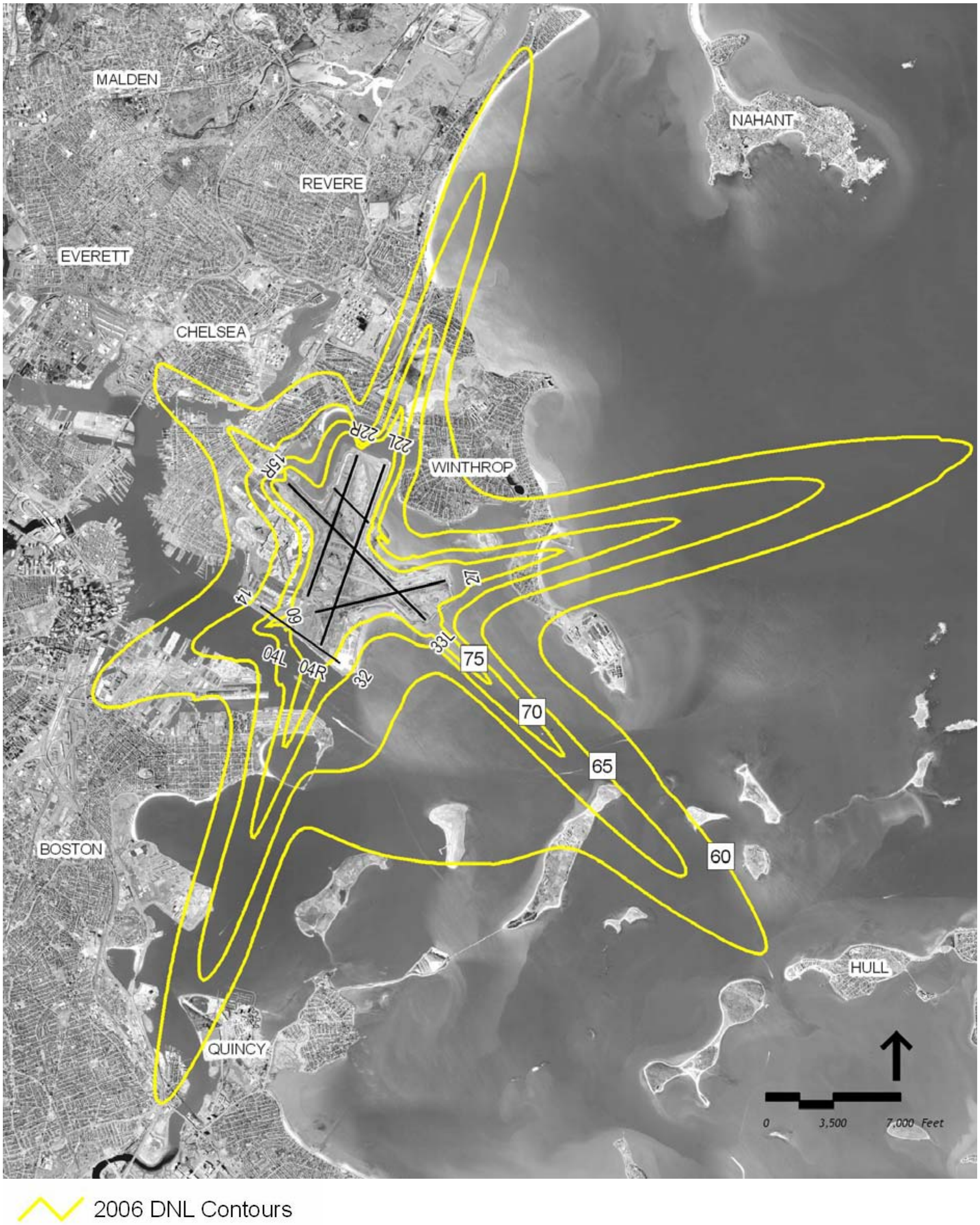


Figure 6-12 Comparison of INMv6.1 65 dB DNL Contours for 2005 and 2006 Operations

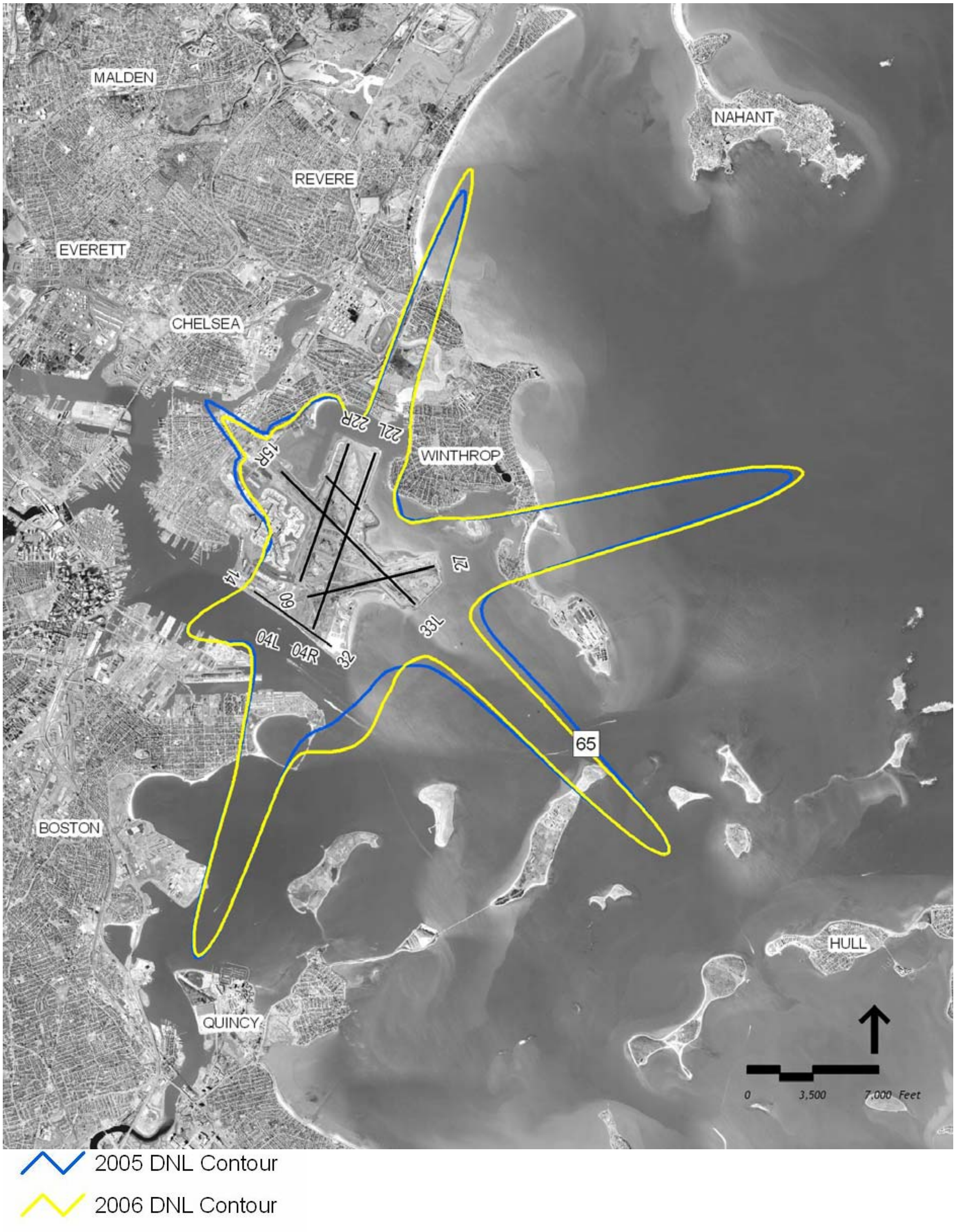


Figure 6-13 Comparison of 2006 INMv6.1 and INMv6.2a 65 dB DNL Contours

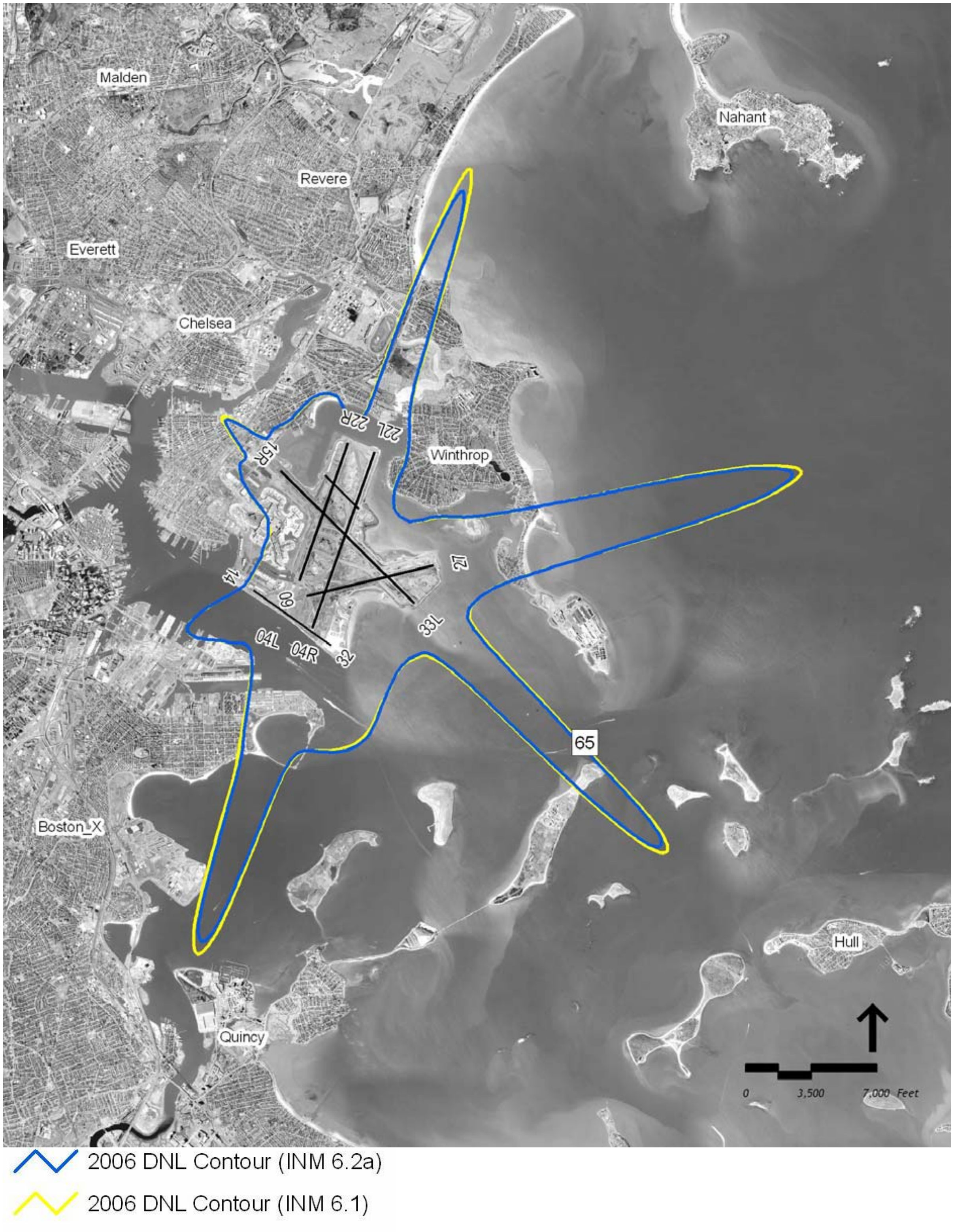


Table 6-6 Noise-exposed Population by Community

Boston

Year	80+ DNL	75-80 DNL	70-75 DNL	65[1]-70 DNL	Total (65+)[1] DNL	Census Base
1990	0	0	1,778	28,970	30,748	1980
1992[2]	0	0	800	4,316	5,116	1980
1993	0	0	264	2,820	3,084	1980
1994	0	106	265	7,698	8,069	1990
1995	0	106	851	8,815	9,772	1990
1996	0	106	374	8,775	9,255	1990
1997	0	106	719	13,857	14,682	1990
1998	0	58*	580	10,877	11,515	1990
1999	0	58	364	11,632[3]	12,054[3]	1990
2000	0	58	183	7,880[3]	8,121[3]	1990
2000	0	0	234	9,014[3]	9,248[3]	2000
2001	0	0	315	6,515[3]	6,700[3]	2000
2002	0	0	257	2,625[3]	2,757[3]	2000
2003	0	0	164	1,730[3]	1,894[3]	2000
2004[4]	0	65	192	4,142[3]	4,399[3]	2000
2005[4]	0	65	104	2,020[3]	2,189[3]	2000
2006 (INMv6.1)[4]	**0**	**65**	**192**	**758[3]**	**1,015[3]**	**2000**
2006 (INMv6.2a)[4]	**0**	**65**	**99**	**1,054[3]**	**1,218[3]**	**2000**

Revere

Year	80+ DNL	75-80 DNL	70-75 DNL	65[1]-70 DNL	Total (65+)[1] DNL
1990	0	0	0	4,274	4,274
1992[2]	0	0	0	3,848	3,848
1993	0	0	0	4,617	4,617
1994	0	0	0	3,569	3,569
1995	0	0	0	3,364	3,364
1996	0	0	172	3,292	3,464
1997	0	0	0	3,293	3,293
1998	0	0	0	3,168	3,168
1999	0	0	128	3,165	3,293
2000	0	0	0	2,552	2,552
2000	0	0	0	2,496	2,496
2001	0	0	0	2,496	2,496
2002	0	0	0	2,822	2,822
2003	0	0	0	2,994	2,994
2004[4]	0	0	82	2,969	3,051
2005[4]	0	0	82	2,540	2,622
2006 (INMv6.1)[4]	**0**	**0**	**169**	**2,843**	**3,012**
2006 (INMv6.2a)[4]	**0**	**0**	**82**	**2,540**	**2,622**

Chelsea

Year	80+ DNL	75-80 DNL	70-75 DNL	65[1]-70 DNL	Total (65+)[1] DNL	Census Base
1990	0	0	0	4,813	4,813	1980
1992[2]	0	0	0	3,952	3,952	1980
1993	0	0	0	0	0	1980
1994	0	0	0	0	0	1990
1995	0	0	0	95	95	1990
1996	0	0	0	0	0	1990
1997	0	0	0	0	0	1990
1998	0	0	0	0	0	1990
1999	0	0	0	95	95	1990
2000	0	0	0	0	0	1990
2000	0	0	0	0	0	2000
2001	0	0	0	0	0	2000
2002	0	0	0	0	0	2000
2003	0	0	0	0	0	2000
2004[4zz]	0	0	0	0	0	2000
2005[4]	0	0	0	0	0	2000
2006 (INMv6.1)[4]	**0**	**0**	**0**	**0**	**0**	**2000**
2006 (INMv6.2a)[4]	**0**	**0**	**0**	**0**	**0**	**2000**

Winthrop

Year	80+ DNL	75-80 DNL	70-75 DNL	65[1]-70 DNL	Total (65+)[1] DNL
1990	0	676	1,211	2,420	4,307
1992[2]	0	626	1,146	2,488	4,262
1993	0	648	1,211	1,773	3,632
1994	0	417	1,343	5,154	6,914
1995	0	482	1,611	5,757	7,850
1996	0	417	1,376	5,930	7,723
1997	0	417	1,659	6,383	8,462
1998	0	519	1,522	6,572	8,613
1999	0	353	1,408	5,946	7,707
2000	0	277	991	5,240	6,508
2000	0	247	1,070	4,637	6,001
2001	0	244	683	4,123	5,050
2002	0	2	481	2,247	2,730
2003	0	0	339	1,956	2,295
2004[4]	0	2	337	1,649	1,988
2005[4]	0	39	347	1,280	1,666
2006 (INMv6.1)[4]	**0**	**122**	**333**	**1,182**	**1,637**
2006 (INMv6.2a)[4]	**0**	**39**	**416**	**1,288**	**1,743**

Table 6-6 Noise-exposed Population by Community (continued)

Everett							All Communities					
Year	80+ DNL	75-80 DNL	70-75 DNL	65[1]-70 DNL	Total (65+)[1] DNL	Census Base	Year	80+ DNL	75-80 DNL	70-75 DNL	65[1]-70 DNL	Total (65+)[1] DNL
1990	0	0	0	0	0	1980	1990	0	676	2,989	40,477	44,142
1992[2]	0	0	0	0	0	1980	1992[2]	0	628	2,352	14,604	17,584
1993	0	0	0	0	0	1980	1993	0	648	1,475	9,210	11,333
1994	0	0	0	0	0	1990	1994	0	523	1,608	16,421	18,552
1995	0	0	0	0	0	1990	1995	0	588	2,462	18,031	21,081
1996	0	0	0	0	0	1990	1996	0	523	1,922	17,997	20,442
1997	0	0	0	0	0	1990	1997	0	523	2,378	23,536	26,437
1998	0	0	0	0	0	1990	1998	0	577	2,102	20,617	23,296
1999	0	0	0	0	0	1990	1999	0	411	1,900	20,838[3]	23,149[3]
2000	0	0	0	0	0	1990	2000	0	335	1,174	15,672[3]	17,181[3]
2000	0	0	0	0	0	2000	2000	0	247	1,304	16,147[3]	17,745[3]
2001	0	0	0	0	0	2000	2001	0	244	998	13,004[3]	14,246[3]
2002	0	0	0	0	0	2000	2002	0	2	613	7,694[3]	8,309[3]
2003	0	0	0	0	0	2000	2003	0	0	503	6,680[3]	7,183[3]
2004[4]	0	0	0	0	0	2000	2004[4]	0	67	611	8,760[3]	9,438[3]
2005[4]	0	0	0	0	0	2000	2005[4]	0	104	533	5,840[3]	6,477[3]
2006 (INMv6.1)[4]	**0**	**0**	**0**	**0**	**0**	**2000**	**2006 (INMv6.1)[4]**	**0**	**187**	**694**	**4,783[3]**	**5,664[3]**
2006 (INMv6.2a)[4]	**0**	**0**	**0**	**0**	**0**	**2000**	**2006 (INMv6.2a)[4]**	**0**	**104**	**597**	**4,882[3]**	**5,583[3]**

Notes: Measured in decibels (dB).
Population estimates for 1999 and 2000 are prepared using 1990 census data. For 2000-2005, calculations are based on the 2000 census data.

1 65 dB DNL is the federally-defined noise criterion used as a guideline to identify when residential land use is considered incompatible with aircraft noise.
2 Data from 1991 not available
3 These values reflect the effect of the FAA-approved terrain adjustment in Orient Heights.
4 2004, 2005, and 2006 results are from the RealContours™ system.

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Table 6-7 Estimated Population within 65 dB[1] DNL Contour

	1990 Census Base										2000 Census Base							Change
	1990	1992[2]	1993	1994	1995	1996	1997	1998	1999	2000	2000	2001	2002	2003	2004[3]	2005[3]	2006 (INMv6.2a)[3]	(2005 to 2006)
Boston																		
East Boston	NA	NA	NA	7,742	9,516	7,840	9,328	7,962	9,015	8,019	8,979	6,639	2,757	1,894	4,399	2,155	1,184	(971)
South Boston	NA	NA	NA	327	256	1,415	5,444	3,553	3,039	102	269	61	0	0	0	34	34	0
Boston total	**30,748**	**5,116**	**3,084**	**8,069**	**9,772**	**9,255**	**14,682**	**11,515**	**12,054[4]**	**8,121[4]**	**9,248[4]**	**6,700[4]**	**2,757[4]**	**1,894[4]**	**4,399[4]**	**2,189[4]**	**1,218[4]**	**(971)**
Chelsea	4,813	3,952	0	0	95	0	0	0	95	0	0	0	0	0	0	0	0	0
Revere	4,274	3,848	4,617	3,569	3,364	3,464	3,293	3,168	3,293	2,552	2,496	2,496	2,822	2,994	3,051	2,622	2,622	0
Winthrop	4,307	2,488	3,632	6,914	7,850	7,723	8,462	8,613	7,707	6,508	6,001	5,050	2,730	2,295	1,988	1,666	1,743	77
Everett	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
All Communities	**44,142**	**15,404**	**11,333**	**18,552**	**21,081**	**20,442**	**26,437**	**23,296**	**23,149**	**17,181**	**17,745**	**14,246**	**8,309**	**7,183**	**9,438**	**6,477**	**5,583**	**(894)**

Notes: Population estimates for 1999 and 2000 are prepared using 1990 census data. For 2000-2006, calculations are based on the 2000 census data.

1 65 dB DNL is the federally-defined noise criterion used as a guideline to identify where residential land use is considered incompatible with aircraft noise.

2 Data from 1991 not available.

3 2004, 2005, and 2006 results are from the RealContours™ system.

4 These values reflect the effect of the FAA-approved terrain adjustment in Orient Heights.

From the data in these tables, the primary findings show:

- As a result of the changes in airport operations in 2006, the number of people exposed to DNL values greater than 65 dB decreased compared to the number in 2005. An estimated 5,583 people were exposed to DNL levels greater than 65 dB in 2006, compared to 6,477 in 2005, and 9,438 in 2004. The majority of the decrease occurred in East Boston, off the northwest end of Runway 33L. The total count of people exposed to 65 dB DNL and above was 61 percent lower than in 2001.
- While arrivals on Runway 22L increased since 2005, departures from Runway 4R decreased, resulting in noise levels and the exposed population in Revere remaining the same.
- Winthrop, which has always experienced the highest levels of exposure of any community around Logan Airport, had the only increase in the number of people exposed to noise levels greater than 65 dB DNL. This number increased by 77 people, but still remains well below its peak in 1998. The number of residents exposed to noise levels over 75 dB DNL remained very close to 2005 levels and still remained below 2001 levels. Households in these areas have already been sound insulated. This increase is due to the increase in arrivals to Runway 27. *Appendix H, Noise Abatement*, includes a summary of additional population counts to a DNL of 60 dB.

In 2006, with the increased use of Runway 4R-22L and Runway 4L-22R, and increase in departures from Runway 9 and arrivals to Runway 27, overall noise levels decreased in most of the communities around Logan Airport but increased somewhat along the extended centerlines of those runways.

Comparing Measured and Modeled Noise Levels

When changes in exposure are predicted by the INM, it is important to substantiate these findings; noise measurements are often utilized for this purpose. Massport's permanent noise monitoring system provides this capability. The system continuously measures the noise levels at each of 30 microphone locations around the Airport and environs, as shown in Figure 6-14. During normal operation, noise monitors at the microphone locations measure hourly noise exposure levels as well as a variety of metrics associated with individual noise events that exceed preset threshold sound levels. Noise monitoring data are transmitted back to Massport's Noise Office, where daily DNL values and other noise metrics are computed for each location and are summarized in various reports.

Prior to 1997, Logan Airport Generic Environmental Impact Reports (GEIRs) and Annual Updates (now ESPRs and EDRs) compared the measured annual average DNL values from the monitors to INM-computed values of DNL at each of the specific noise monitor sites to check for reasonableness. Many sites produced small differences between measurements and predictions, particularly as adjustments were incorporated into the modeling process to account for the over-water sound propagation and hill effects. However, results at more distant locations have often produced significant differences of 10 or more dB, especially at measurement sites where DNL values were often less than 60 dB.

Upon investigation, one of the major factors contributing to these differences was that the measured levels included aircraft as well as community-based noise sources in the vicinity of the monitor, while the INM-computed levels included the noise only from aircraft. This tended to make measured levels higher than modeled values at certain locations.

Figure 6-14 Noise Monitor Locations

As a result, commencing at the end of 1997, Massport enhanced its noise monitoring system to separate aircraft noise events from other sources to produce aircraft-only DNL values in addition to the total DNL values it previously acquired. The monitoring system's ability to distinguish aircraft from community-based noise sources now allows a better comparison of measured and modeled noise levels.

A second factor identified as potentially contributing to the differences between measured and modeled DNL values (especially at the more-distant noise monitoring sites), is aircraft altitude. Typical noise modeling uses distance from origin to destination to determine the appropriate climb profile for an aircraft; however, many aircraft climb more slowly than the standard profiles would suggest, especially if the pilot must make a turn shortly after takeoff. Thus, beginning with the *2002 EDR*, Massport enhanced the modeling process by using radar data from its monitoring system to determine the best available climb profile (see *Appendix H, Noise Abatement*). RealProfiles™ further enhances this process by modeling the actual climb profile instead of selecting the best fit among a standard set. This technique resulted in modeling lower altitudes over many of the farther-out monitoring sites, reducing the differences between measured and modeled sound levels at those locations.

Finally, to assure that the noise monitoring locations are modeled as accurately as possible, latitudes and longitudes of each measurement site were verified by survey and their exact coordinates entered into the INM. These improvements in modeling techniques are now fully integrated into the measured-versus-modeled (INM) comparisons that follow.

Table 6-8 compares the measured 2006 DNL values at each measurement site to the modeled 2006 DNL value. The differences between the Measured and Modeled are presented and compared to the measured versus modeled differences from 2005.

Due to the use of RealContours™, Massport is able to compute the modeled DNL for the actual periods that the noise monitoring system was collecting data at each site. However, due to the installation of the new monitoring system the measured data for November and December 2006 are unavailable at this time for all sites. Also several sites had missing data for several months during the year:

- Site 5 – missing July
- Site 12 – missing January and March to May
- Site 14 – missing July to September
- Site 15 – missing January
- Site 16 – missing January to July
- Site 30 – missing August

In most cases the differences between measured versus modeled were reduced in 2006. Consistent with the changes in the contour, all of the sites in East Boston decreased in level compared to 2005. There are increases in Nahant, Revere, Swampscott, and Lynn which were due to increased arrivals to Runway 22L and departures from Runway 4R.

Table 6-8 Comparison of Measured DNL Values to RealContours-modeled DNL Values

Location	Site	Distance from Logan Airport (miles)	2006 Measured Aircraft – Only DNL	2006 Modeled RC Results (DNL)[1]	2006 Difference - Measured vs. Modeled	2005 Difference - Measured vs. Modeled
Winthrop – Bayview and Grandview	4	1.6	74.5	77.5	3.0	3.2
Winthrop – Harborview and Faun Bar	5	1.9	67.1	67.9	0.8	0.8
Winthrop – Somerset near Johnson	6	0.8	65.9	64.2	(1.7)	(2.7)
Winthrop – Loring Road near Court	7	1.0	69.5	68.8	(0.7)	(0.5)
Winthrop – Morton and Amelia	8	1.6	62.2	63.2	1.0	0.2
East Boston – Bayswater near Annavoy	9	1.3	71.3	72.5	1.2	1.3
East Boston – Bayswater near Shawsheen	10	1.3	64.2	63.1	(1.1)	(2.2)
East Boston – Selma and Orient[2]	11[2]	1.8	61.1	58.1	(3.0)	(1.7)
East Boston Yacht Club	12	1.2	68.1	71.2	3.1	0.8
East Boston High School	13	1.9	61.8	62.3	0.5	(0.7)
East Boston – Jeffries Point Yacht Club	14	1.2	61.1	60.5	(0.6)	(0.6)
East Boston – Piers Park	30	1.5	57.2	57.8	0.6	(2.0)
Chelsea – Admiral's Hill	15	2.8	62.6	59.9	(2.7)	(4.4)
Revere – Bradstreet and Sales	16	2.4	66.8	69.1	2.3	1.1
Revere – Carey Circle	17	5.3	60.5	59.1	(1.4)	(1.6)
Nahant – U.S.C.G. Recreational Facility	18	5.9	60.5	46.9	(13.6)	(14.5)
Everett – Tremont near Prescott	21	4.5	55.0	52.5	(2.5)	(1.8)
Medford – Magoun near Thatcher	22	6.0	52.0	49.5	(2.5)	(5.9)
Swampscott – Smith Lane	19	8.7	48.4	47.6	(0.8)	(4.1)
Lynn – Pond and Towns Court	20	8.4	55.7	50.4	(5.3)	(4.9)
South End – Andrews Street	1	3.7	59.0	57.2	(1.8)	(4.3)
South Boston – B and Bolton	2	2.9	60.1	60.7	0.6	(2.8)
South Boston – Day Blvd. near Farragut	3	2.5	63.1	64.8	1.7	1.9
Roxbury – Boston Latin Academy	27	5.3	57.9	54.7	(3.2)	(5.3)
Jamaica Plain - Southbourne Road	28	7.7	54.0	51.1	(2.9)	(5.9)
Mattapan – Lewenburg School	29	7.3	55.4	48.1	(7.3)	(6.0)
Dorchester – Myrtlebank near Hilltop	23	6.3	58.0	55.2	(2.8)	(3.7)
Milton – Cunningham Park near Fullers	24	8.1	53.2	52.7	(0.5)	(3.3)
Quincy – Squaw Rock Park	25	4.2	52.1	49.3	(2.8)	(5.3)
Hull – Hull High School near Channel Street	26	6.0	59.7	57.5	(2.2)	(2.5)

Note: 2006 Modeled results were computed to match the same number of months for which the monitor was operational.

1 INMv6.2a with adjusted database. (Database modifications as described in the *Logan Airport 1994/1995 Generic Environmental Impact Report.*

2 Includes FAA-approved terrain adjustment modifying normal INMv6.2a result for Site 11.

Supplemental Metrics

Cumulative Noise Index (CNI)

Massport reports total annual fleet noise at Logan Airport, defined in the Logan Noise Rules by a metric referred to as the CNI. The CNI is a single number representing the sum of the entire set of single-event noise levels experienced at the Airport over a full year of operation, weighted similarly to DNL so that activity occurring at night is penalized by adding an extra 10 dB to each event. This penalty is mathematically equivalent to multiplying the number of nighttime events by each aircraft by a factor of 10.

The Logan Noise Rules define CNI in terms of EPNdB and require that the index be computed for the fleet of commercial aircraft operating at Logan Airport throughout the year. In addition, in EDRs and ESPRs, Massport reports partial CNI values of noise at Logan Airport, so that various subsets of the fleet (cargo, night operations, passenger jets, etc.) are identified.

The Noise Rules, adopted by Massport following public hearings held in February 1986, established a CNI limit of 156.5 EPNdB. The CNI generally has decreased since 1990, remaining below that cap, and with typical changes from one year to the next have been on the order of a few tenths of a dB. The 2006 CNI of 152.6 EPNdB represents a 0.6 dB decrease from 2005. The percentage of nighttime operations decreased slightly. The 2006 CNI remains well below the cap of 156.5 EPNdB.

Partial CNI Calculations

Partial CNI values were obtained by summing the noise energy from particular segments of Logan Airport's total operations. They are useful for identifying the greatest contributors to overall noise. These results are shown in Table 6-9. The higher the partial CNI from a sector of the fleet, the greater the contribution to total noise. For example, passenger jets contributed approximately 5 dB more noise to the total exposure in 2006 than cargo aircraft, and nighttime operations continued to contribute more noise than daytime activity. Also, nighttime flights by air carriers contributed more noise than nighttime cargo operations. Overall nighttime CNI was down slightly in 2006 compared to 2005, even though commercial nighttime operations increased

PRAS Short Term Goals

In order to provide temporary relief to neighborhoods affected by regular overflights during single or multi-day periods, the PRAS Advisory Committee established two short–term goals for the system in addition to the annual goals:

- Provide relief from excessive dwell. Exceedance would be defined as more than seven hours of operations over a given area during any day between the hours of 7:00 AM and midnight.
- Provide relief from excessive persistence. Exceedance would be defined as more than 23 hours of operations over an area between 7:00 AM and midnight during a period of three consecutive days.

Table 6-9 Cumulative Noise Index (EPNdB)

	Logan Airport CNI Cap – 156.5 EPNdB																	
	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	Change from 2005
Full CNI (Entire Commercial Jet Fleet)	**156.4**	**155.8**	**155.5**	**155.3**	**155.4**	**155.3**	**155.1**	**154.8**	**154.7**	**154.9**	**154.7**	**154.1**	**153.2**	**152.7**	**153.4**	**153.2**	**152.6**	**(0.6)**
Total Passenger Jets	155.2	154.8	154.6	154.4	154.4	154.2	154.1	153.9	153.7	153.9	153.6	152.9	151.8	151.3	152.2	152.1	151.4	(0.8)
Total Cargo Jets	150.1	148.9	148.0	147.9	148.3	148.8	148.6	147.5	147.9	148.0	148.2	147.8	147.4	147.1	147.0	146.6	146.5	(0.1)
Total Daytime	152.5	152.1	152.4	152.1	152.1	151.6	151.2	150.8	150.4	150.4	149.5	149.0	148.5	148.0	148.5	148.2	147.5	(0.7)
Total Nighttime	154.4	153.4	152.6	152.4	152.6	152.9	152.9	152.5	152.7	153.1	153.1	152.4	151.3	150.9	151.7	151.6	151.0	(0.6)
Total Stage 2 Jets	NA	NA	NA	NA	151.0	150.2	149.4	149.2	147.7	147.1	124.7	121.5	114.3	114.1	118.1	NA	NA	NA
Total Stage 3 Jets	NA	NA	NA	NA	153.4	153.8	153.8	153.4	153.8	154.2	154.7	154.1	153.2	152.7	153.4	153.2	152.6	(0.6)
Daytime Stage 2	NA	NA	NA	NA	149.0	148.5	147.6	146.5	145.2	144.1	122.6	119.3	111.2	113.7	109.4	NA	NA	NA
Nighttime Stage 2	NA	NA	NA	NA	146.7	145.1	144.8	145.8	144.1	144.0	120.5	117.3	111.4	103.2	117.5	NA	NA	NA
Daytime Stage 3	NA	NA	NA	NA	149.1	148.8	148.7	148.8	148.9	149.2	149.5	149.0	148.5	148.0	148.5	148.2	147.5	(0.7)
Nighttime Stage 3	NA	NA	NA	NA	151.4	152.1	152.2	151.5	152.1	152.5	153.1	152.4	151.3	150.9	151.7	151.6	151.0	(0.6)
Passenger Jet Stage 2	NA	NA	NA	NA	150.5	149.9	149.2	148.9	147.5	146.8	124.2	116.3	NA	NA	NA	NA	NA	NA
Passenger Jet Stage 3	NA	NA	NA	NA	152.2	152.3	152.3	152.2	152.6	153.0	153.6	152.9	151.8	151.3	152.2	152.1	151.4	(0.8)
Cargo Jet Stage 2	NA	NA	NA	NA	141.5	137.4	136.8	137.4	139.0	134.5	114.8	119.9	114.3	114.1	118.1	NA	NA	NA
Cargo Jet Stage 3	NA	NA	NA	NA	147.3	148.5	148.3	147.0	147.3	147.9	148.2	147.8	147.4	147.1	147.0	146.6	146.5	(0.1)
Daytime Passenger	NA	152.0	152.2	152.0	152.0	151.5	151.1	150.6	150.1	150.1	149.3	148.7	148.2	147.7	148.2	147.9	147.2	(0.8)
Nighttime Passenger	NA	151.6	150.9	150.6	150.8	151.0	151.0	151.1	151.2	151.6	151.6	150.8	149.4	148.8	150.0	150.1	149.3	(0.8)
Daytime Cargo	137.1	137.1	137.6	135.2	136.1	138.0	136.7	136.2	138.0	138.2	137.5	137.1	137.0	136.2	135.7	135.8	135.5	(0.3)
Nighttime Cargo	149.9	148.6	147.6	147.6	148.0	148.4	148.3	147.1	147.5	147.6	147.8	147.4	147.0	146.8	146.7	146.2	146.1	(0.1)
Daytime Passenger Stage 2	NA	NA	NA	NA	148.9	148.4	147.6	146.5	145.0	143.9	122.3	115.0	NA	NA	NA	NA	NA	NA
Daytime Passenger Stage 3	NA	NA	NA	NA	149.0	148.5	148.4	148.5	148.6	149.0	149.2	148.7	148.2	147.7	148.2	147.9	147.2	(0.8)
Nighttime Passenger Stage 2	NA	NA	NA	NA	149.0	148.5	148.4	148.5	142.8	143.7	119.8	110.2	NA	NA	NA	NA	NA	NA
Nighttime Passenger Stage 3	NA	NA	NA	NA	149.4	149.9	150.1	149.8	150.5	150.8	151.6	150.8	149.4	148.8	150.0	150.1	149.3	(0.8)
Daytime Cargo Stage 2	NA	NA	NA	NA	128.3	126.7	124.6	126.4	131.6	131.5	111.1	117.3	111.2	113.7	109.4	NA	NA	NA
Daytime Cargo Stage 3	NA	NA	NA	NA	135.3	137.7	136.4	135.7	136.9	137.1	137.5	137.0	137.0	136.1	135.7	135.8	135.5	(0.3)
Nighttime Cargo Stage 2	NA	NA	NA	NA	141.3	137.0	136.5	137.0	138.2	131.5	112.3	116.4	111.4	103.2	117.5	NA	NA	NA
Nighttime Cargo Stage 3	NA	NA	NA	NA	147.0	148.1	148.0	146.6	146.9	147.5	147.8	147.4	147.0	146.8	146.7	146.2	146.1	(0.1)

Note: General aviation and non-jet aircraft are not included in the calculation.
NA No operations by this aircraft type in the commercial fleet.

In contrast to the annual goals that count the number of equivalent operations on a runway, dwell and persistence are measured by the number of hours that a given location or area is subject to jet aircraft overflights. The PRAS Advisory Committee designated eight runway combinations for computing the effects of dwell and persistence on the communities. Table 6-10 shows the dwell and persistence areas by community.

This *2006 EDR* reports on dwell and persistence as required as part of Massport's commitments to the *Logan Airside Improvements Planning Project*.[8] Higher levels of dwell or persistence for overwater areas represent a benefit since this results in a corresponding decrease in total hours over populated areas.

Table 6-10 Representative Neighborhoods Affected by Runway Use

Runway	Representative Affected Neighborhoods
4L & R Arrivals	South Boston (Farragut St.), Dorchester, Quincy, Milton, Weymouth, and Braintree
32 & 33L Arrivals	Boston Harbor, Hull, Cohasset, Hingham, Scituate, and Norwell
14 & 15 Departures	Boston Harbor, Hull, Cohasset, Hingham, and Scituate
22L & R Departures	South Boston (Farragut Street), and Boston Harbor
27 Departures	South Boston (Fan Pier), Roxbury, Jamaica Plain, South End, West Roxbury, Roslindale, Brookline, and Hyde Park
4 L& R departures Plus 22L&R Arrivals	East Boston (Bayswater, Orient Heights), Winthrop (Court Road), Revere, and Nahant
9 Departures Plus 27 Arrivals	Winthrop (Point Shirley), and Boston Harbor
33 Departures Plus 15 Arrivals	East Boston (Eagle Hill), Chelsea, Everett, Medford, Somerville, Arlington, and Cambridge

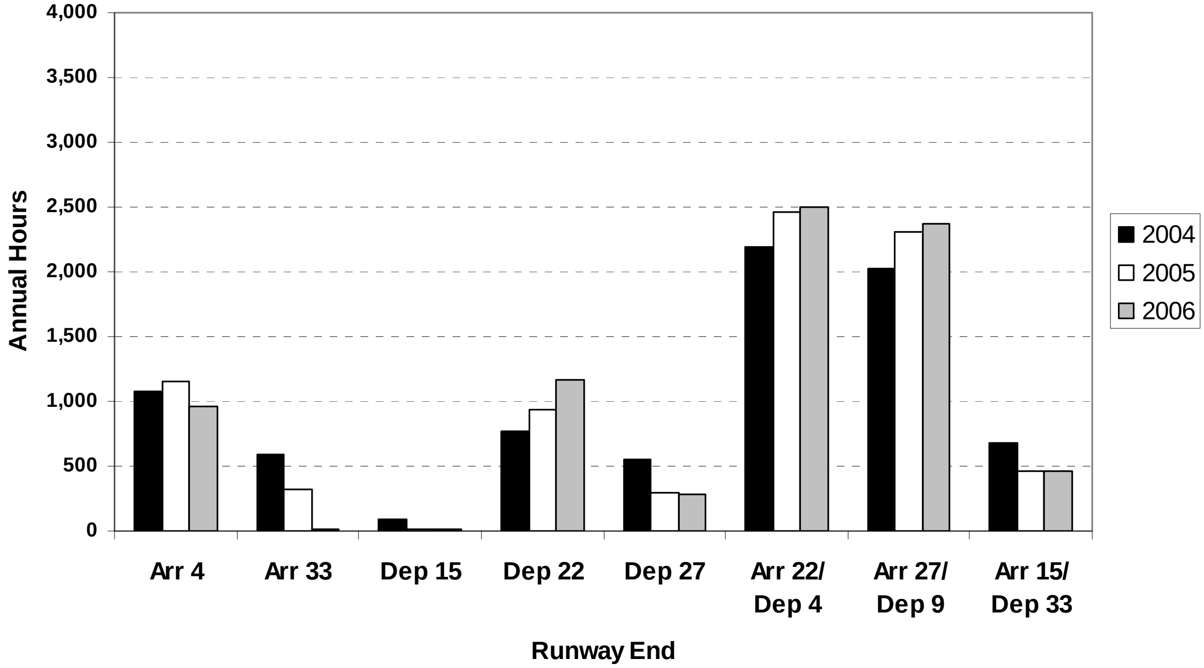
Figures 6-15 and 6-16, respectively, illustrate the annual hours of dwell and persistence exceedence by runway end for 2004 through 2006.

Time Above

The third supplemental noise metric reported in this *2006 EDR* is the amount of time that aircraft noise is higher than each of three predefined threshold sound levels. The measure is referred to generally as time above (TA), and the threshold sound levels used in the analysis are 65, 75, and 85 dBA (A-weighted decibels). Like DNL values, these times are computed using the FAA-approved INM as modified for Logan Airport. The calculations are made at each of Massport's permanent noise monitoring locations and are based on an average 24-hour day during the year as well as for the average 9-hour nighttime period from 10:00 PM to 7:00 AM. The threshold sound levels of 65, 75, and 85 dBA reflect different degrees of speech interference depending on factors such as whether people are outdoors, indoors with their windows open, or indoors with windows closed. Table 6-11 presents a summary of the calculated TA values for 2006.

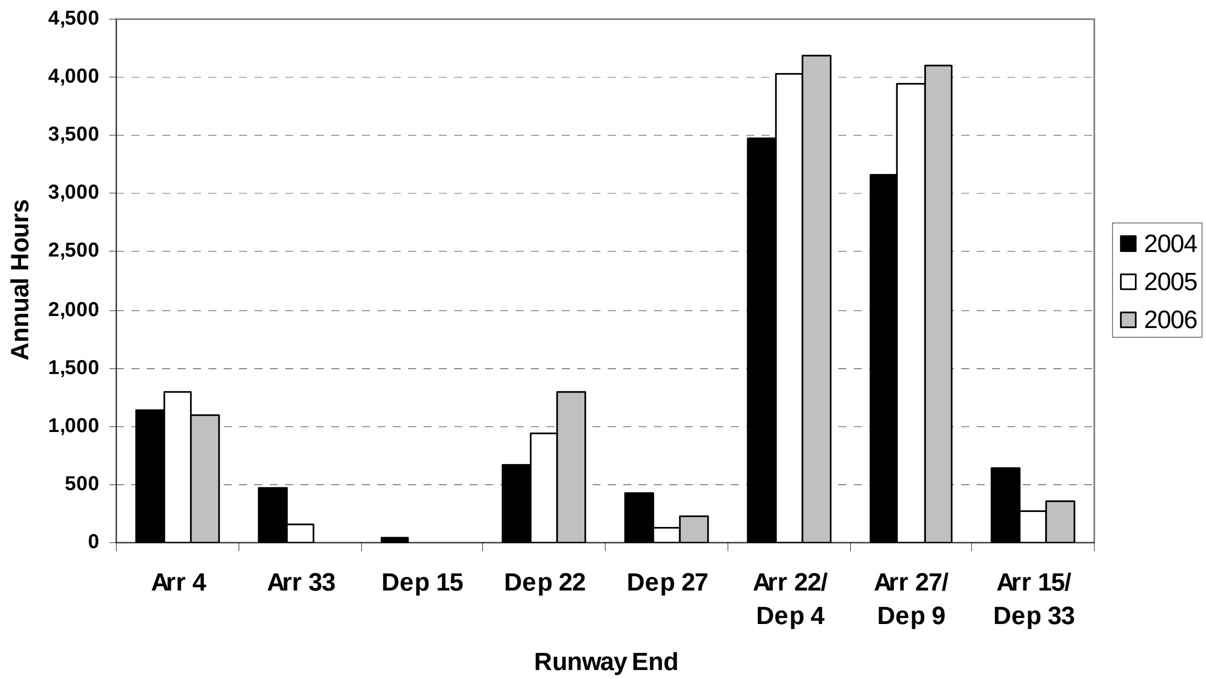
8 *Logan Airside Improvements Planning Project Final EIS*, Section 4.2.3 PRAS Monitoring and Reporting June 2002.

Figure 6-15 Comparison of Annual Hours of Dwell Exceedance by Runway End for 2004 to 2006



Note: Runway 14-32 opened in November 2006 and therefore is not included in this comparison.

Figure 6-16 Comparison of Annual Hours of Persistence Exceedance by Runway End for 2004 to 2006



Note: Runway 14-32 opened in November 2006 and therefore is not included in this comparison.

Table 6-11 Time Above dBA Thresholds for Average Day, 2006[1]

Location	Site	Distance from Logan Airport (miles)	Minutes above Threshold in a 24-Hour Period			Minutes above Threshold During Nighttime			Modeled Day-Night Sound Levels[2]
			85dBA	75dBA	65dBA	85dBA	75dBA	65dBA	
Winthrop – Bayview and Grandview	4	1.6	17.8	55.6	125.9	2.3	6.4	15.2	77.4
Winthrop – Harborview and Faun Bar	5	1.9	1.4	24.4	111.5	0.2	3.0	13.5	67.8
Winthrop – Somerset near Johnson	6	0.8	0.1	3.1	90.7	0.0	1.1	14.7	64.1
Winthrop – Loring Road near Court	7	1.0	1.1	26.3	193.7	0.1	4.3	27.5	68.8
Winthrop – Morton and Amelia	8	1.6	0.3	4.6	67.9	0.0	0.7	11.6	63.1
East Boston – Bayswater near Annavoy	9	1.3	5.2	31.7	96.4	1.1	5.0	14.7	72.7
East Boston – Bayswater near Shawsheen	10	1.3	0.6	5.8	41.1	0.0	0.7	7.0	63.0
East Boston – Selma and Orient	11	1.8	0.0	1.4	22.1	0.0	0.2	3.5	58.1
East Boston Yacht Club	12	1.2	1.1	44.8	229.0	0.3	7.4	31.8	70.5
East Boston High School	13	1.9	0.5	4.4	19.7	0.1	0.5	3.4	62.4
East Boston – Jeffries Point Yacht Club	14	1.2	0.0	0.9	39.9	0.0	0.3	7.5	60.6
East Boston – Piers Park	30	1.5	0.0	0.2	14.6	0.0	0.0	3.9	57.9
Chelsea – Admiral's Hill	15	2.8	0.3	3.1	13.8	0.0	0.4	1.6	59.8
Revere – Bradstreet and Sales	16	2.4	2.8	16.8	42.4	0.6	2.9	7.6	69.0
Revere – Carey Circle	17	5.3	0.0	2.6	24.6	0.0	0.5	4.2	59.2
Nahant – U.S.C.G. Recreational Facility	18	5.9	0.0	0.0	1.5	0.0	0.0	0.1	46.7
Everett – Tremont near Prescott	21	4.5	0.0	0.4	5.3	0.0	0.1	0.6	52.3
Medford – Magoun near Thatcher	22	6.0	0.0	0.2	3.5	0.0	0.0	0.4	49.6
Swampscott – Smith Lane	19	8.7	0.0	0.1	2.1	0.0	0.0	0.2	47.4
Lynn - Pond and Towns Court	20	8.4	0.0	0.1	3.0	0.0	0.0	0.8	50.7
South End – Andrews Street	1	3.7	0.1	1.3	13.3	0.0	0.2	2.0	57.1
South Boston – B and Bolton	2	2.9	0.2	2.9	21.3	0.1	0.6	2.9	60.7
South Boston – Day Blvd. near Farragut	3	2.5	0.5	10.8	70.4	0.1	1.2	8.8	64.5
Roxbury – Boston Latin Academy	27	5.3	0.0	0.7	10.9	0.0	0.1	1.6	54.3
Jamaica Plain - Southbourne Road	28	7.7	0.0	0.2	4.2	0.0	0.0	0.7	50.5
Mattapan – Lewenburg School	29	7.3	0.0	0.0	1.5	0.0	0.0	0.2	48.0
Dorchester – Myrtlebank near Hilltop	23	6.3	0.0	0.2	12.9	0.0	0.0	2.0	55.1
Milton – Cunningham Park near Fullers	24	8.1	0.0	0.1	5.3	0.0	0.0	0.8	52.9
Quincy – Squaw Rock Park	25	4.2	0.0	0.1	1.4	0.0	0.0	0.1	47.9
Hull – Hull High School near Channel Street	26	6.0	0.0	0.6	16.6	0.0	0.2	4.2	57.1

Notes: Site 28 installed in Winter 2003/2004.
Distance from Logan Airport calculated from the Airport Reference Point.
1 INMv6.2a for all of 2006 (12 months) with adjusted database. (Database modifications as described in the *Logan Airport 1994/1995 GEIR).*
2 Modeled using RealContours/RealProfiles using INM 6.2a

The TA results at many of the sites correspond to the change in the contour levels. At site 4, which is affected by Runway 9 departures and Runway 27 arrivals (utilization for arrivals increased and departures decreased in 2006), the TA65 level increased from 119.0 minutes in 2005 to 125.9 minutes in 2006, the TA75 slightly decreased (from 56.3 in 2005 to 55.6 in 2006) and TA85 decreased (from 23.2 in 2005 to 17.8 in 2006). Site 12, which is affected by Runway 22R and 15R departures, experienced an increase in the TA65 and TA75 levels. The TA65 increased from 168.9 minutes in 2005 to 229.0 minutes in 2006 and the TA75 increased from 28.9 minutes in 2005 to 44.8 minutes in 2006.

In most locations around Logan Airport, the total time in minutes that people experience noise above a certain level increased between 2005 and 2006. Exceptions to this were in South Boston and Dorchester.

Noise Abatement

As noise at Logan Airport has decreased in recent years, Massport's emphasis on noise abatement has focused on the benefits of better analysis tools and improved modeling techniques for the purpose of identifying remaining causes of noise problems. In 2004, Logan Airport experienced an increase in annual operations for the first time since the drop-off that occurred following September 11, 2001. In 2005, the increase continued with operations 17 percent below 2000 operations, compared to 18 percent in 2004. In 2006, operations declined slightly but still remained above 2004 levels. During a period of recovering activity at Logan Airport, Massport's noise abatement program has played a critical role in helping to monitor noise impacts.

During 2004, Massport issued a request for proposal (RFP), received submittals, and selected the ERA Corporation (formerly Rannoch) to provide a new noise and operations monitoring system. Installation and acceptance of the new system are expected in 2007. Unlike the current stand-alone system, the new system will be incorporated directly into Massport's computer network. Other significant benefits of the new system will include vastly improved analysis and mapping capabilities, use of multi-lateration radar (a separate and unique source of operational data), and correlation of noise events with radar flight paths and complaints (a feature that the present system does not have). This latter capability should further improve the ability of the system to differentiate between aircraft and community noise sources.

The new noise and operations monitoring system will be capable of obtaining the same or better quality flight tracking data as is available with the current radar. In 2004, Massport evaluated radar data provided both by FAA STARS and by Megadata's PASSUR system and found the PASSUR data to be more consistent with its current requirements. The PASSUR data is used in the current monitoring system and has been used since the *2004 ESPR*.

Other continuing elements of Massport's noise mitigation program include:

- One of the most extensive residential and school sound insulation programs in the nation. To date, Massport has installed sound insulation in 4,901 residences, including 9,943 dwelling units, and 36 schools in East Boston, Roxbury, Dorchester, Winthrop, Revere, Chelsea, and South Boston.
- To initiate the process with each new grant, Massport's Project Manager for the Residential Sound Insulation Program (RSIP) mails applications to a set of eligible homeowners and often follows up with phone calls to encourage participation. Historically, the percentage of eligible homeowners who respond and whose dwellings are ultimately treated varies significantly by community from a high of nearly 90 percent in Revere to a low of about 50 percent in South Boston. Eighty to 85 percent of homeowners in East Boston and Winthrop typically participate. Approximately 8 percent of applicants also choose the Room-of-Preference option that allows the owner to identify a room (usually a bedroom or living room) for extra acoustical treatment.

- Noise rules that restrict nighttime operations of all remaining Stage 2 aircraft between the hours of 11:00 PM and 7:00 AM.
- Flight tracks designed to optimize over-water operations (especially during nighttime hours).
- Replacement of Noise Monitoring System Software to improve analysis and reporting capabilities and to provide a back-up capability in case the normal FAA radar data stream is interrupted.
- Continued use of a web site that features an internet flight tracking system known as Airport Monitor (www.massport.com/logan). The site provides the general public the opportunity to observe or track individual flights in and out of Logan Airport; it also provides substantive information on Massport's sound insulation program, the Airport's noise monitoring system, various abatement measures, and other information of interest to the public.
- On-line logging of noise complaints.
- Summary reports of operations by airline, by runway, by aircraft type, and by other parameters that help the Noise Office track potential changes in the noise environment. Tables 6-12 and 6-13 provide examples of such reports.

Table 6-12 summarizes how commercial air carrier and cargo operators are deploying the newest engine technology at Logan Airport. The table presents the listing of each airline operator and the percentage of its fleet that is full Stage 3 compliant, sorted by airline. Of the major cargo operators, UPS improved their percentage of Stage 3 operations to 98 percent, FedEx dropped slightly from 72 to 70 percent, and DHL dropped as they merged with Airborne, who had no full Stage 3 operations at Logan in 2006. Most of the charter operators remained similar to 2005 or increased their percentage of Stage 3 operations. Only two major US Airlines do not have a 100 percent Stage 3 fleet operating at Logan Airport. Northwest Airlines is in the process of phasing out its fleet of DC-9 aircraft and improved its Stage 3 level to 94 percent. Delta Air Lines increased to 98 percent with the use of some 737-200 aircraft on some of its routes.

Table 6-13 provides the number of flight operations, the resulting partial CNI by airline for 2006 and the partial CNI by operation for 2005 and 2006. The table shows the relative contribution of each airline to total CNI and reflects the contributions of individual aircraft noise levels and the frequency with which they occur. Table 6-14 demonstrates how different airline categories contribute to the noise environment at Logan Airport.

Regional carriers are near the bottom of the list whereas cargo operators, which operate older louder aircraft, often at night, are near the top of the list. The relative positions for the domestic carriers are due mainly to their fleet and percent of night operations. United Airlines has 17 percent of its operations at night as opposed to Airtran which has only 5 percent at night. JetBlue Airways has one of the highest night percentages (18 percent) but operates a much newer fleet than American Airlines or United Airlines.

Massport's NAO staff has oversight responsibility for implementation of the noise abatement actions. NAO personnel enforce the noise rules; collect and analyze data with the Noise Monitoring System; respond to noise complaints; and coordinate with the FAA on operational noise abatement measures. In addition, the staff oversees the yearly evaluation of progress through the development of DNL contours and associated population impact assessments, CNI calculations, and other related analyses.

Table 6-12 Percentage of Airline Operations in Full Stage 3 Aircraft During 2006

Air Carrier	Number of Flights (2006)	Percentage of Full Stage 3 Operations[1] 2002	2003	2004	2005	2006	100% Full Stage 3[2]
Aer Lingus	860	100%	100%	100%	100%	100%	✓
Aeromexico	210	100%	100%	100%	100%	100%	✓
Air Canada	3,950	90%	97%	100%	100%	100%	✓
Air France	1,209	100%	100%	100%	100%	100%	✓
Airborne Express	8	0%[3]	0%[3]	0%[3]	53%	0%[3]	
Airtran Airways	19,761	93%	100%	100%	100%	100%	✓
Alaska Airlines	1,097	99%	100%	100%	100%	100%	✓
Alitalia	810	100%	100%	100%	100%	100%	✓
America West	4,220	100%	100%	100%	100%	100%	✓
American Airlines	29,455	100%	100%	100%	100%	100%	✓
American Eagle Airlines	33,939	100%	100%	100%	100%	100%	✓
American Trans Air	10	99%	100%	100%	100%	100%	✓
British Airways	2,192	100%	100%	100%	100%	100%	✓
Capital Cargo International	408	0%[3]	0%[3]	0%[3]	0%[3]	0%[3]	
Cayman Airways	60	NA	NA	43%	71%	96%	
Champion Air	58	NA	NA	NA	0%[3]	0%[3]	
Chantilly Air	43	NA	NA	NA	NA	100%	✓
Chatauqua	10,836	100%	100%	100%	100%	100%	✓
Continental	13,976	100%	100%	100%	100%	100%	✓
Delta Air Lines	32,731	75%	90%	100%	97%	98%	
DHL Airways	1,146	6%	3%	0%[3]	20%	1%	
East Coast Jets	89	NA	NA	NA	NA	100%	✓
Federal Express	4,539	74%	76%	70%	72%	70%	
Finnair	51	NA	NA	NA	100%	100%	✓
Icelandair	946	100%	100%	100%	100%	100%	✓
Independence Air	45	NA	NA	NA	NA	100%	✓
Jazz by Air Canada/ Air Nova	7,132	100%	100%	100%	100%	100%	✓
JetBlue Airways	32,548	NA	NA	100%	100%	100%	✓

Air Carrier	Number of Flights (2006)	Percentage of Full Stage 3 Operations[1] 2002	2003	2004	2005	2006	100% Full Stage 3[2]
Kittyhawk	552	4%	4%	5%	1%	30%	
Lufthansa	1,522	100%	100%	100%	100%	100%	✓
Miami Air Int'l	115	29%	29%	78%	98%	91%	
Midwest Express	4,287	9%	58%	99%	100%	100%	✓
North American	374	99%	100%	100%	100%	100%	✓
Northwest	9,386	81%	84%	87%	87%	94%	
Omni Airlines	2	NA	NA	100%	100%	100%	✓
Pace Airlines	24	NA	100%	71%	75%	27%	
Pinnacle Air Group	3,934	NA	NA	NA	NA	100%	✓
PSA Airlines	246	NA	NA	NA	NA	100%	✓
Ryan International	245	23%	8%	24%	72%	67%	
Sata International Airlines	334	100%	100%	100%	100%	100%	✓
Saudi Arabian Airlines	18	NA	NA	100%	100%	100%	✓
Sky King	14	NA	NA	NA	0%[3]	0%[3]	
Spirit Airlines	683	NA	NA	NA	NA	100%	✓
Swiss International Airlines	708	100%	100%	100%	100%	100%	✓
TACA	236	NA	100%	100%	100%	100%	✓
TACA Costa Rica	12	NA	100%	100%	NA	100%	✓
Trans States/American Connection	610	NA	100%	100%	100%	100%	✓
United Airlines	21,153	100%	100%	100%	100%	100%	✓
United Express/AWAC	1,381	NA	NA	NA	100%	100%	✓
United Express/Mesa	3,814	NA	NA	NA	0%[3]	100%	✓
United Parcel Service	1,666	97%	90%	94%	94%	98%	
US Airways	38,513	100%	100%	100%	100%	100%	✓
USA Jet Airlines	6	NA	NA	NA	0%[3]	0%[3]	
Virgin Atlantic	729	100%	100%	100%	100%	100%	✓
World	2	100%	100%	100%	100%	100%	✓
Xtra Airways	191	NA	NA	NA	100%	100%	✓

Source: Massport.
Notes: Airlines operate the balance of their operations in recertificated Stage 3 as well as some Stage 2 aircraft weighing less than 75,000 pounds. Except where noted by a plus (+), airlines having less than a 100 percent full Stage 3 fleet operated the balance of their flights in recertificated or re-engined aircraft that have been recertificated as Stage 3.
NA Airline had no operations at Logan Airport.
1 Operations for some carriers differ with those in *Chapter 2, Activity Levels* and *Chapter 7, Air Quality/Emissions Reduction* because this table only includes jet aircraft and not turboprops, and because it includes both scheduled and unscheduled air carriers.
2 New Stage 3 means originally manufactured as a certified Stage 3 aircraft under Federal Regulation Part 36.
3 No aircraft used at the Airport were full Stage 3 aircraft.

Table 6-13 Annual Operations and Partial CNI by Airline During 2006

Airlines with more than 100 flights in 2006	2006 Operations[1]	2006 Total Airline CNI	Partial CNI per Operation 2005	Partial CNI per Operation 2006	Airline Category
Federal Express	4,539	144.42	107.86	107.85	Cargo
DHL Airways	1,146	138.34	107.47	107.75	Cargo
United Parcel Service	1,666	138.95	107.07	106.74	Cargo
Kitty Hawk	552	130.86	104.29	103.44	Cargo
Capital Cargo International	408	129.35	103.22	103.25	Cargo
British Airways	2,192	136.54	102.47	103.14	International
TACA	236	125.83	101.65	102.10	International
Continental	13,976	140.83	101.42	101.28	Domestic
Virgin Atlantic	729	131.13	101.30	102.50	International
SATA International Airlines	334	126.25	100.63	101.01	International
United Airlines	21,153	143.18	100.11	99.93	Domestic
Lufthansa	1,522	131.25	100.07	99.42	International
Aeromexico	210	122.32	99.92	99.09	International
America West Airlines	4,220	141.47	99.39	99.54	Domestic
Delta Air Lines	32,731	142.97	99.11	97.82	Domestic
American Airlines	29,455	141.47	99.03	96.78	Domestic
Northwest	9,386	137.93	98.52	98.21	Domestic
North American	374	123.65	98.45	97.92	Charter
JetBlue Airways	32,548	141.95	98.22	96.82	Domestic
Aer Lingus	1,020	126.94	97.60	96.86	International
Alaska Airlines	810	130.94	97.41	100.54	Domestic
Ryan International	245	123.86	97.15	99.97	International
US Airways	38,513	142.05	97.09	96.19	Domestic
Air France	1,209	128.85	96.74	98.03	International
Swiss Air	708	125.14	96.51	96.64	International
Alitalia	810	125.33	96.34	96.25	International
Icelandair	946	124.21	94.24	94.45	International
Air Canada	3,950	131.21	93.81	95.25	International
Midwest Express	4,287	129.34	93.21	93.02	Regional
American Eagle Airlines	33,939	137.71	91.70	92.40	Regional
Air Canada Jazz	7,132	129.60	91.63	91.07	Regional
AirTran Airways	19,761	135.90	91.28	92.94	Domestic
Trans States Airlines	610	118.57	90.99	90.71	Regional
Chautauqua	10,836	131.54	90.59	91.19	Regional
United Express/AWAC	1,381	121.10	90.11	89.70	Regional
Mesa Airlines	3,814	128.05	90.28	92.24	Regional
PSA Airlines	246	112.36	89.60	88.45	Regional

Source: Massport.

1 Operations for some carriers differ to those in *Chapter 2, Activity Levels* and *Chapter 7, Air Quality/Emissions Reduction* because this table only includes jet aircraft and not turboprops, and because it includes both scheduled and unscheduled air carriers.

In 2006, Massport received a total of 3,955 noise complaints from 50 communities, an increase of 33 percent from 2005, when the NAO received 2,964 complaints. Among communities with more than 100 annual complaints, the greatest increases were in Cambridge (up from 192 in 2005 to 367 in 2006), Chelsea (up from 156 in 2005 to 260 in 2006), Hull (up from 108 in 2005 to 312), and Nahant (up from 51 in 2005 to 318). Only two communities with more than 100 annual complaints experienced a decrease in noise complaints for 2006 – Hingham (down from 311 in 2005 to 242 in 2006) and Jamaica Plain (down from 380 in 2005 to 218 in 2006). Complaints in Lexington increased from 500 in 2005 to 642 in 2006, but it should be noted that all of the complaints in 2006 were from the same individual. *Appendix H, Noise Abatement* has a full listing of the complaints by community. Possible factors that may have contributed to the increase in complaints include the increased use of the parallel runways due to construction activities.

Massport's noise abatement goals are achieved through implementation of multiple elements. Table 6-14 lists these goals and the associated plan elements, and reports on progress toward achieving these goals.

Boston Overflight Noise Study (BONS)

The FAA's Record of Decision (ROD) approving construction of the new unidirectional Runway 14-32 requires that the FAA, Massport, and the Community Advisory Committee (CAC) jointly undertake a study to determine whether changes to existing noise abatement flight track corridors might further reduce noise impacts. In addition, the Massachusetts Environmental Policy Act (MEPA) Certificate for the Airside Improvements EIR directed Massport to work with the FAA and local communities on a review of the Logan Airport PRAS.

The BONS is being conducted in multiple phases. Phase 1 of the Study was initiated in the winter of 2004 and was completed in fall of 2006. During Phase 1, 55 airspace and operational alternatives to reduce noise related to Logan Airport overflights were identified and screened for safety, operational, and noise benefits. Of the 55 alternatives, 12 measures were identified as potentially implementable in the near term.

Phase 2 includes a more detailed analysis of alternatives (plus other alternatives that may be proposed by the FAA, the community and other interested parties) as well as an assessment of alternatives requiring additional environmental review and including ground noise. Phase 2 will also begin the initial work on re-evaluating Logan Airport's PRAS. This Phase began in spring of 2007.

Centerfield Taxiway Project

The Centerfield Taxiway is included in the list of airfield actions to improve Logan Airport's safety and efficiency and was studied extensively in the Boston-Logan Airside Improvements Planning EIS/EIR (1995 to 2002). Massport received state environmental approval from MEPA. As part of its ROD for the Airside Project under NEPA, the FAA deferred its decision on Centerfield Taxiway Project pending an operational review to identify any other potential beneficial actions. The FAA directed the technical work on the operational review and led the briefings to a citizen panel. The FAA divided the study into two phases. Phase 1 focused on current conditions and Taxiway November, and Phase 2 included operations with both Taxiways November and Centerfield. Both of these Phases are complete and the public comment period on the project ended in September of 2006. FAA released its ROD for this project on April 20, 2007. The ROD states "FAA concludes that the data and analysis contained in the EIS with regard to the environmental impacts of the proposed Centerfield Taxiway are still adequate, accurate, current and valid, and that FAA has fulfilled its mitigation commitment, as detailed in the 2002 ROD on the Airside Improvements Planning Project, 'to assess potential beneficial operational procedures that would preserve or improve the operational and environmental benefits of the Centerfield Taxiway as shown in the EIS.'"

Table 6-14 Noise Abatement Management Plan

Noise Abatement Goal	Plan Elements	2006 Progress Report
Limit total aircraft noise	Limit on CNI	The CNI value for 2006 was 152.6 EPNdB, significantly below the cap of 156.6 EPNdB.
	Stage 3 percentage Requirement in Noise Rules	In 2006, Stage 3 operations represented 100 percent of Logan Airport's total commercial jet traffic. The few Stage 2 operations that occurred during the year were all older small corporate jets flown by Charters and because these aircraft were less than 75,000 pounds gross takeoff weight, they were in full compliance with FAR Part 91, but still prohibited from operating at Logan Airport during the hours of 11:00 PM to 7:00 AM.
Mitigate noise impacts	Residential Sound Insulation Program	857 dwelling units were sound insulated in 2006, bringing the total of treated dwelling units to 9,943 since the start of the program in 1986. The increase in units sound insulated in 2006 compared to 2005 (471 to 857) is due to the Sound Insulation Program currently underway in Chelsea (424 units in 2006) as part of mitigation commitments for the Airside EIS. See *Appendix H, Noise Abatement* for additional details.
	School Sound Insulation Program	36 eligible schools have been sound insulated.
	Noise Abatement Arrival and Departure Procedures	Flight track monitoring and data analysis were used to check adherence to noise abatement flight procedures. See *Appendix H, Noise Abatement* for copies of the 2006 monitoring report.
	PRAS Runway End Use Goals	The PRAS system was last used early in 2004 but disabled when the TRACON switched to the STARS radar and moved to Merrimack, NH. Massport is upgrading the system to handle the new STARS data and may further modify it as necessary to accommodate any new runway use goals derived during the BONS study.
	Runway Restrictions	Continued noise-based use restrictions 24 hours per day on departures from Runway 4L and arrivals on Runway 22R.
	Reduced-Engine Taxiing	Use of reduced-engine taxiing is encouraged where appropriate and safe.
Improve Noise Monitoring System	Replace Existing Noise Monitors, Install Multi-lateration Antennas for Flight Track Monitoring, and Install New Robust Software	Massport wrote a specification for a state-of-the-art system and contracted with ERA Corporation to install the system in 2005 and work began in 2006. New noise monitors will provide 1/3 octave band data at all sites to aide with aircraft identification. Noise events, flight events, and complaints will all be linked. Multilateration will provide improved radar coverage near the ground to help in identification of aircraft and runway assignment.
Minimize nighttime noise	Nighttime Stage 2 Aircraft Prohibition	Continued prohibition of Stage 2 aircraft from operations at Logan Airport between 11:00 PM and 7:00 AM.
	Nighttime Runway Restrictions	Continued prohibitions on use of Runway 4L for departures and Runway 22R for arrivals between 11:00 PM and 6:00 AM.
	Maximization of Late-Night Over-Water Operation	Continued efforts to maximize late-night over-water operations. Continued use of Runway 15R for departures and Runway 33L for arrivals.
	Nighttime Engine Run-up and APU Restrictions	Continued restriction on nighttime engine run-ups and use of auxiliary power units (APUs).
Address/respond to noise issues and complaints	Noise Complaint Line	Continued operation of Noise Complaint Line (617) 561-3333. In 2006, Massport's NAO responded to 3,955 calls from callers living in 50 communities. The 2006 Noise Report issued by the NAO is provided in *Appendix H, Noise Abatement*.
	Special Studies	Continued to provide technical assistance and analysis using noise monitoring system to support FAA and others in monitoring jet departure tracks off of Runway 27.
		The BONS will determine whether changes to existing flight track corridors might reduce noise impacts. Phase 1 is complete and Phase 2 began in spring of 2006.

7

Air Quality/ Emissions Reduction

Introduction

This chapter describes the air quality conditions at Logan Airport in 2006 and compares them to air quality conditions in 2005. The chapter contains an inventory of on-airport emissions of volatile organic compounds (VOCs), oxides of nitrogen (NO_x), carbon monoxide (CO), and particulate matter (PM).[1] It contains an update of air quality monitoring data for nitrogen dioxide (NO_2) collected by Massport and the Massachusetts Department of Environmental Protection (MDEP). The chapter also includes status reports on Massport's Air Quality Initiative (AQI) (a 15-year voluntary program with the goal of maintaining NO_x emissions at, or below, 1999 levels); and the Logan Air Monitoring Program (a new, two-year initiative designed to establish baseline air quality conditions in the neighborhoods that surround the Airport).

Key Findings

Highlights for 2006 are:

- The emissions inventory changes are driven largely by improvements to the Federal Aviation Administration (FAA) Emissions and Dispersion Modeling System (EDMS), v5.0.1. These include the addition of aircraft main engine startup VOC emissions; adjustments to how aircraft performance profiles are modeled, which changed aircraft times-in-mode and thus emissions of all pollutants; an advanced method to calculate aircraft PM_{10}/$PM_{2.5}$ emissions; and updated ground support equipment (GSE) emission factors using NONROAD2005. The in-place air quality initiatives at Logan Airport and other ongoing efforts by Massport to minimize emissions also played a role, as did changes to aircraft taxi time, fleet mix, and number of operations.
- Largely because of these changes to EDMS, total emissions of VOCs appear to have increased by approximately 34 percent to 1,724 kilograms per day (kg/day) compared to 2005 levels. Using the EDMS available in 2005 (v4.5) total emissions of VOCs would have decreased by approximately 9 percent to

1 PM less than or equal to 10 microns (PM10) and PM less than or equal to 2.5 microns (PM2.5) are subsets of PM.

1,168 kg/day due to a combination of changes in aircraft fleet mix, low GSE emission factors, and reduction in deicing activities. This information was included to show that the increase in VOCs (the only pollutant to increase in 2006) was due entirely to the updated EDMS model and not the result of changes in Airport operations.

- Total emissions of NO_x were 4,151 kg/day or 1 percent lower than 2005 levels.
- Total emissions of CO were 8,144 kg/day or 15 percent lower than 2005 levels.
- Total emissions of $PM_{10}/PM_{2.5}$ were approximately 78 kg/day or 7 percent lower than 2005 levels.
- In 2006, NO_x emissions at Logan Airport were approximately 677 tons per year (tpy) lower than the 1999 AQI benchmark. This represents a 28 percent decrease since 1999.
- There was a continuing trend of decreasing NO_2 concentrations at both the Massport and MDEP monitoring sites located in the general vicinity of Logan Airport. In addition, in 2006 the annual NO_2 concentrations at all monitoring locations were well below the NO_2 air quality standards.

Regulatory Framework

The federal Clean Air Act (CAA), the National Ambient Air Quality Standards (NAAQS), and similar state regulations govern air quality issues in Massachusetts. The NAAQS and the Massachusetts State Implementation Plan (SIP) promulgated pursuant to, and in compliance with the CAA, regulate air quality issues in this area. Updates to both the NAAQS and the SIP are briefly discussed below.

National Ambient Air Quality Standards

The United States (U.S.) Environmental Protection Agency (EPA) established NAAQS for a group of criteria air pollutants to protect public health, the environment, and the quality of life from the detrimental effects of air pollution. These NAAQS are set for the following six pollutants: CO, lead (Pb), NO_2, ozone (O_3), PM_{10} $PM_{2.5}$ and sulfur oxides (SO_x). The NAAQS primary standards (designed to protect human health) and secondary standards (designed to protect human welfare) are contained in Table 7-1.

Based on air monitoring data and in accordance with the CAA, all areas within Massachusetts are designated with respect to the NAAQS as *attainment*, *nonattainment*, *maintenance*, or *unclassifiable*. An area with air quality better than the NAAQS is designated as attainment; an area with air quality worse than the NAAQS is designated as nonattainment. An area may be designated as unclassifiable when there is a temporary lack of data to form a basis of attainment status. Nonattainment areas are further classified as extreme, severe, serious, moderate, and marginal by the degree of non-compliance with the NAAQS. The current attainment/ nonattainment designations for the Boston metropolitan area are summarized in Table 7-2.

As shown in Table 7-2, the entire Boston metropolitan area is currently designated as in attainment for all the criteria pollutants except O_3, and is designated as moderate nonattainment for the eight-hour O_3 standard. The ozone nonattainment area consists of 10 counties in Massachusetts (Barnstable, Bristol, Dukes, Essex, Middlesex, Nantucket, Norfolk, Plymouth, Suffolk, and Worcester). Logan Airport is located in Suffolk County.

Table 7-1 National Ambient Air Quality Standards

Pollutant	Averaging Time	Standard ppm	Standard μg/m³	Notes:
Carbon Monoxide (CO)	1 hour	35	40,000	Not to be exceeded more than once a year.
	8 hour	9	10,000	Not to be exceeded more than once a year.
Lead (Pb)	Quarterly	—	1.5	Not to exceed this level.
Nitrogen Dioxide (NO_2)	Annual	0.053	100	Not to exceed this level.
Ozone (O_3)	1 hour	0.12	235	Number of exceedances averaged over three years must be less than or equal to 1. Standard was revoked by EPA in June 2005.
	8 hour	0.08	157	The average of the annual 4th highest daily 8-hour maximum over a three-year period is not to exceed this level.
Particulate Matter with a diameter ≤ 10 μm (PM_{10})	24 hour	—	150	Not to be exceeded more than once a year.
	Annual	—	—	Standard was revoked by EPA in 2006.
Particulate Matter with a diameter ≤ 2.5 μm ($PM_{2.5}$)	24 hour	—	35	The three-year average of the 98th percentile for each population-oriented monitor within an area is not to exceed this level.
	Annual	—	15	The three-year average of the annual arithmetic mean from single or multiple monitors within an area is not to exceed this level.
Sulfur Oxides (SO_x)	3 hour[1]	0.50	1,300	Not to be exceeded more than once a year.
	24 hour	0.14	365	Not to be exceeded more than once a year.
	Annual	0.03	80	Not to exceed this level.

Source: EPA, 2007 (www.epa.gov/air/criteria.html).
1 Secondary standard designed to protect public welfare, where the rest are Primary standards, which protect public health.
ppm Parts per million.
μg/m³ Micrograms per cubic meter.

Table 7-2 Attainment/Nonattainment Designations for the Boston Metropolitan Area

Pollutant	Designation
Carbon monoxide (CO)	Attainment
Nitrogen Dioxides (NO_2)	Attainment
Ozone (O_3) (1-hr)[1]	Nonattainment (Serious)
Ozone (O_3) (8-hr)[2]	Nonattainment (Moderate)
Particulate matter (PM_{10})	Attainment
Particulate matter ($PM_{2.5}$)	Attainment
Sulfur Dioxide (SO_2)	Attainment
Lead (Pb)	Attainment

Source: EPA, 2007 (www.epa.gov/air/oaqps/greenbk/).
1 The 1-hour Ozone standard was revoked by EPA effective June 15, 2005.
2 On December 22, 2006, the DC Circuit Court of Appeals vacated the 8-hour ozone standard and remanded the entire ozone issue to EPA. This was still under review at the time the *2006 EDR* was published.

State Implementation Plan

Because the Boston area did not meet the one-hour NAAQS for O_3, a SIP has been developed to reduce O_3 levels to meet the NAAQS for this nonattainment pollutant. The SIP is the regulatory scheme for bringing nonattainment areas in Massachusetts into compliance with the NAAQS. Since the EPA recently designated the Boston area as moderate nonattainment for the new eight-hour O_3 standard, the MDEP is required to submit a new SIP to the EPA by 2007 that demonstrates progress towards compliance being achieved by 2010. The current and future SIPs for the Boston area are summarized in Table 7-3.

Table 7-3 State Implementation Plan for Ozone

Standard	Title	Status	Comments
One-Hour	One-hour Ozone Attainment Demonstration for the Massachusetts Portion of the Boston-Lawrence-Worcester, Massachusetts-New Hampshire Ozone Nonattainment Area.	Published December 6, 2002 as final rule.	EPA approved this SIP revision and established an attainment date of November 15, 2007, for the entire multi-state nonattainment area. Focuses on the control of NO_x and VOCs as precursors to O_3. This is the "currently approved" SIP for the Boston area.
Eight-Hour	Eight-hour Ozone Attainment Demonstration for the Massachusetts Portion of the Boston-Lawrence-Worcester, Massachusetts-New Hampshire Ozone Nonattainment Area.	Under development.[1]	To be submitted to the EPA in June 2007 for approval. This standard calls for the attainment of the new eight-hour NAAQS for O_3 by 2010 and focuses on the control of NO_x and VOCs as precursors to O_3.

Source: EPA, 2007 EPA 40 Code of Federal Regulations (CFR) Part 52, Federal Register, Vol. 67, No. 167, August 28, 2002, pp. 55121-55125.
EPA 40 CFR Part 52, Federal Register, Vol. 67, No. 235, December 6, 2002, pp. 72576-72579.

1 On December 22, 2006, the DC Circuit Court of Appeals vacated the 8-hour ozone standard and remanded the entire ozone issue to EPA. This was still under review at the time the *2006 EDR* was published.

Logan Airport Air Quality Permits for Stationary Sources of Emissions

Massport received a Title V Air Operating Permit for Logan Airport in September 2004. This permit covers all of the Massport-operated stationary sources including the central heating and cooling plant, boilers, electrical generators, and fuel storage tanks.

Methodology for Emissions Inventory

The air quality analysis of air emissions associated with Logan Airport operations includes the following source categories. Each of the emissions sources has its own assessment methodology, database, and assumptions as described below:

- **Aircraft Emissions** — The FAA EDMS is the EPA-preferred and the FAA-required program for calculating aircraft emissions. Since the FAA continually improves the performance, precision and adaptability of the EDMS, the program is subject to regular updates and revisions. For this analysis, the most recent version, EDMSv5.0.1[2], was used to compute the 2006 Logan Airport emissions inventory. Compared to the last version (EDMSv4.5)[3] used in the *2005 EDR*, there are a few significant changes; the most notable are the addition of aircraft main engine startup VOC emissions, adjustments to how aircraft performance profiles

2 Released March of 2007.
3 Between EDMS v4.5 and 5.0.1, the FAA released version 5.0 in January of 2007.

are modeled (which adjusts aircraft time-in-mode), an advanced method to calculate aircraft PM emissions using the FAA first-order-approximation (FOA3), and updated GSE emission factors using NONROAD2005.[4]

As with recent Environmental Status and Planning Reports (ESPRs) and Environmental Data Reports (EDRs), the actual aircraft fleet mix at Logan Airport was used to analyze 2006 conditions. In a few instances where the aircraft/engine type or combinations actually used at Logan Airport were not available in the EDMS database, consistent with FAA guidance, substitutions were made based on the closest match of aircraft type and engine performance characteristic. Table I-1 in *Appendix I, Air Quality/Emissions Reduction* contains the data that were used, including aircraft type, engine, landing and takeoff operations (LTOs), and aircraft taxi-times. The aircraft are grouped into four categories: commercial air carriers, commuter aircraft, general aviation, and cargo aircraft. From 2005 to 2006, total LTOs decreased by approximately 1 percent. However, air carrier LTOs increased by approximately 4 percent, cargo LTOs were unchanged, commuter LTOs decreased by approximately 9 percent, and general aviation decreased by approximately 4 percent.

- Aircraft taxi-times are based on data obtained from the FAA Aviation System Performance Metrics (ASPM) database for 2006.[5] Aircraft taxi-times increased from 25.15 to 25.32 minutes, which is an increase of less than 1 percent.

- **Ground Service Equipment —** Estimates of GSE emissions for 2006 were based on EDMS emission factors and continue to reflect emission reductions attributable to Massport's Alternative Fuel Vehicle (AFV) Program, and the conversion of Massport and tenant GSE and fleet vehicles to compressed natural gas (CNG) or electricity. Model input data are based on the 2001 AFV Survey conducted by Massport, and an on-site GSE time-in-mode survey completed in 2004.

- **Motor Vehicles —** Motor vehicle emission factor data were obtained from the most recent version of EPA's MOBILE model (MOBILE6.2.03) combined with MDEP recommended motor vehicle fleet mix data, operating conditions, and other Massachusetts-specific input parameters. MOBILE is preferred by the MDEP and used to develop motor vehicle emissions budgets for the SIP. A copy of the MOBILE input/output files is included in *Appendix I, Air Quality/Emissions Reduction*. *Chapter 5, Ground Transportation*, of this *2006 EDR* provides a discussion of the vehicle miles traveled (VMT) data used for this air quality analysis. For the purposes of the analysis, 2005 VMT data were extrapolated using the same percentage as passenger growth between 2005 and 2006.

- **Other Sources —** Emissions associated with the fuel storage and handling facilities, the central heating and cooling plant, and other stationary sources at Logan Airport were based on annual fuel throughput records for 2006, combined with EPA emission factors (Compilation of Air Pollution Emission Factors [AP-42]). Deicing activities, No. 6 fuel oil, and snow melter usage showed significant decreases by approximately 40 percent, 55 percent, and 77 percent, respectively, while natural gas usage increased.

- **Particulate Matter —** Estimates of PM emissions associated with Logan Airport were first reported in the *2005 EDR* in response to the recent availability of an FAA-updated method (e.g., First Order Approximation) for computing aircraft $PM_{10}/PM_{2.5}$ emission factors. $PM_{10}/PM_{2.5}$ emissions are reported for 2006 and will be reported in all future EDRs/ESPRs. Measurements of PM from aircraft engines indicate that most of the particles are less than 2.5 microns in diameter ($PM_{2.5}$).[6] Generally, for other emission sources such as GSE, boilers, and motor vehicles, $PM_{2.5}$ is a fraction of the PM_{10}.

4 NONROAD2005 was released December 7, 2005.
5 FAA Aviation System Performance Metrics (ASPM) database for 2006 (www.apo.data.faa.gov).
6 Making the assumption that all particles are less than 2.5 microns in diameter is consistent with the Aircraft Particle Emissions eXperiment (APEX), www.particles.grc.nasa.gov/apex.html.

Emissions Inventory for 2006

This section provides a summary of the 2006 emissions inventory for Logan Airport activities for the pollutants VOC, CO, NO_x and $PM_{10}/PM_{2.5}$. Emissions of O_3 are not computed as it is a secondary pollutant formed from emissions of NO_x and VOCs. Emissions of SO_x and Pb are also not computed, as airport emission sources are very small generators of these two compounds. The emissions inventory was computed based on the actual number of aircraft operations and fleet mix, passenger enplanements, and cargo activity levels at the Airport in 2006. Correspondingly, emissions associated with GSE, motor vehicles, fuel storage and transfer facilities, and a variety of stationary sources (i.e., steam boilers, snow melters, live fire training, back-up generators, etc.) on the Airport site were also computed.

As in preceding EDRs, the outcomes of the 2006 emissions inventory are compared with the results for 2005 and other previous years. For consistency, the 2006 analysis was conducted using both versions of the EDMS available for 2005 (v4.5) and 2006 (v5.0.1), respectively. This way, the changes in Logan Airport air quality conditions can be evaluated in both the short- and long-terms, and on a common basis. For the AQI, estimates of 2015 NO_x emissions are also provided as a means of monitoring the progress of this voluntary emission management program.

Volatile Organic Compounds

In 2006, total VOC emissions at Logan Airport were approximately 694 tpy (1,724 kg/day); an estimated increase of approximately 34 percent from 2005 levels. However, this calculated increase is largely due to the addition of aircraft main engine startup emissions to EDMS v5.0.1; a new feature that did not exist in prior versions of EDMS. If 2006 VOC emissions were calculated using the same version of EDMS used for the *2005 EDR,* total emissions of VOCs would have decreased by approximately 9 percent, Nevertheless, Figure 7-1 depicts a long-term downward trend in VOC emissions at Logan Airport and Figure 7-2 shows the 2006 percent breakdown of these emissions, by source category. Similarly, Table 7-4 shows the computed VOC emissions in kg/day for each emission source from 1993 to 2006. Other significant findings include the following:

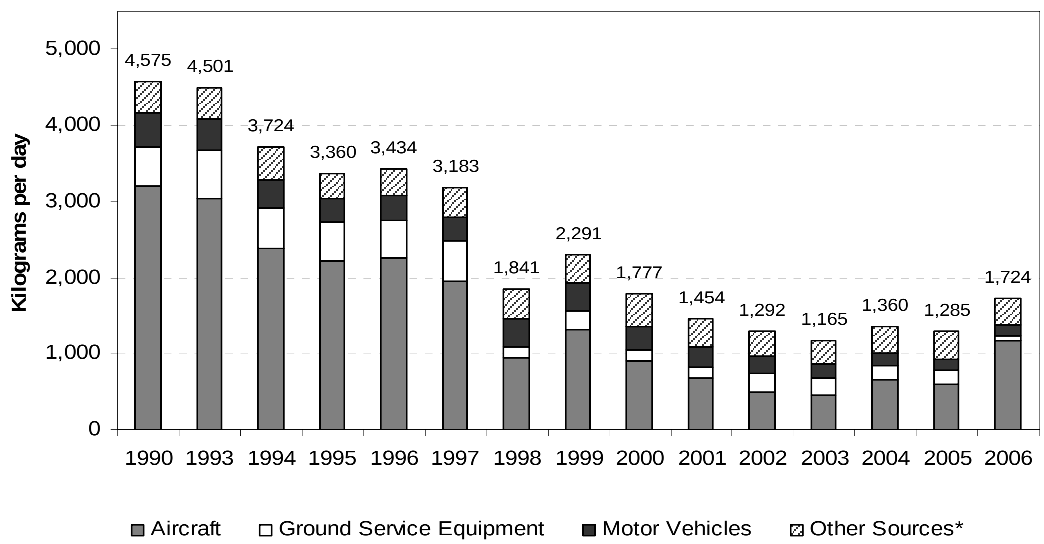
- Total modeled aircraft-related VOC emissions were higher by approximately 94 percent in 2006, when compared to 2005. Again, this increase was largely due to the modeling software that now includes the addition of main engine startup VOC emissions. This increase is also due to generally longer aircraft times-in-mode in EDMSv5.0.1 and higher reported taxi and delay times at Logan Airport in 2006 when compared to 2005.[7] Also new in EDMS are improvements to the modeling of aircraft flight profiles by taking into account items such as weather, and individual aircraft and engine characteristics. This advancement generally results in longer aircraft times-in-mode, and thus increased VOC emissions, than those calculated with prior versions of EDMS. By comparison, aircraft-related VOCs are shown to decrease by 13 percent between 2005 and 2006 when using the prior version of EDMS.
- GSE-related VOC emissions were lower in 2006 by approximately 57 percent than in 2005 mostly due to the change in aircraft fleet mix and updated GSE emission factors using NONROAD2005.
- Total VOC emissions from motor vehicles in 2006 also declined from 2005 levels by approximately 10 percent. Since VMT were extrapolated to increase slightly over 2005 levels, the reduction in motor vehicle emissions is attributable to the lower emission factors of the 2006 motor vehicle fleet.

7 Taxi–in and taxi-out and delay times were obtained from the FAA Aviation System Performance Metrics (ASPM) database for 2006 (www.apo.data.faa.gov/).

- VOC emissions from stationary and other sources (e.g., fuel storage/handling, central heating and cooling plant, snow melter usage and fire training) decreased by 3 percent from 2005 to 2006, mostly due to less deicing activities.

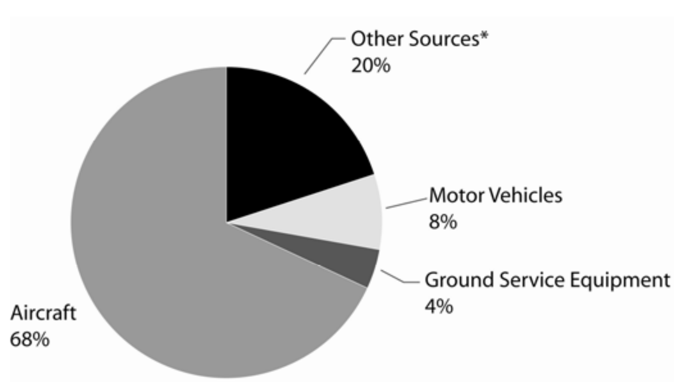
As shown in Figure 7-2, aircraft continue to represent the largest source (68 percent) of VOC emissions associated with Logan Airport followed by stationary sources (20 percent), motor vehicles (eight percent), and GSE (four percent). In summary, the results for 2006 contained in Table 7-4 reveal a 34 percent increase of total emissions of VOCs when compared to 2005, whereas the total emissions of VOCs would have decreased by approximately nine percent if the EDMS available in 2005 (v4.5) had been used. This discrepancy is largely attributed to EDMS v5.0.1 including aircraft main engine startup emissions and longer aircraft times-in-mode.

Figure 7-1 Emissions of VOCs at Logan Airport



* Other sources include stationary sources (e.g., central heating and cooling plant, snow melter usage, fire training, etc.) and fueling sources.

Figure 7-2 Sources of VOC Emissions in 2006



* Other sources include stationary sources (e.g., central heating and cooling plant, snow melter usage, fire training, etc.) and fueling sources.

Table 7-4 Estimated VOC Emissions (in kg/day) at Logan Airport[1]

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999[2]	2000	2001	2002	2003	2004	2005	2006[3]	
Aircraft/GSE Model	**Logan Dispersion Modeling System (LDMS)**								**EDMS 3.22**	**EDMS 4.21**	**EDMS 4.03**		**EDMS 4.11**		**EDMS 4.21**	**EDMS 4.5**		**EDMS 5.0.1**
Motor Vehicle Model	**MOBILE5a**								**MOB5a_h**	**MOB6.2.03**	**MOB6.0**			**MOB6.2.01**	**MOB6.2.03**			
Aircraft Sources																		
Air carriers	2,175			1,958	1,554	1,407	1,390	1,227	736	653	514	374	248	208	292	271	227	**511**
Commuter aircraft	681			943	543	531	622	498	154	196	140	113	75	95	127	140	125	**371**
Cargo aircraft	303			89	244	236	214	207	43	318	207	149	127	94	110	41	19	**46**
General aviation	44			51	48	36	24	27	13	141	42	43	52	61	127	147	147	**236**
Total aircraft sources	3,203			3,041	2,389	2,210	2,250	1,959	946	1,308	903	680	502	458	656	599	518	**1,164**[6]
Ground Service Equipment[4]	518			636	533	521	497	530	145	243	153	143	247[5]	227	187	178	167	**77**
Motor Vehicles																		
Ted Williams Tunnel through-traffic	NA			NA	NA	NA	NA	NA	NA	15	12	10	9	0[7]	0[7]	0[7]	0[7]	**0**[7]
Parking/curbside	192			173	148	127	102	102	118	101	89	77	51	45	38	37	33	**33**
On-airport vehicles[8]	258			238	215	179	223	205	258	256	206	170	152	135	129	118	106	**106**
Total motor vehicle sources	450			411	363	306	325	307	376	372	307	257	212	180	167	155	139	**139**
Other Sources																		
Fuel storage/handling	400			408	434	318	356	381	372	352	412	372	329	297	341	340	336	**336**
Miscellaneous sources[9]	4			5	5	5	6	6	2	16	2	2	2	3	9	13	8	**8**
Total other sources	404			413	439	323	362	387	374	368	414	374	331	300	350	353	344	**344**
Total Airport Sources	4,575	NA	NA	4,501	3,724	3,360	3,434	3,183	1,841	2,291	1,777	1,454	1,292	1,165	1,360	1,285	1,168	**1,724**[10]

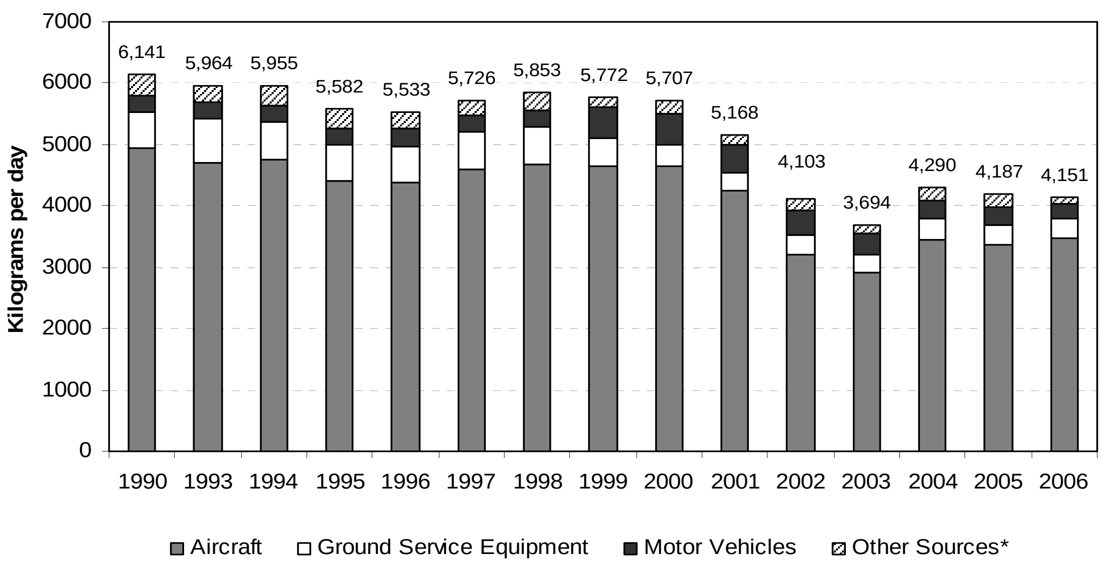
kg/day Kilograms per day. 1 kg/day is approximately equivalent to 0.40234 tons per year (tpy).
NA Information not available.
MOB MOBILE model for motor vehicle emissions (MOB5a_h=MOBILE5a_h, MOB6.2=MOBILE6.2 version .01 or version .03).
1 The emissions inventory for 1990 is shown in the *2005 EDR* emission inventories for 1991 and 1992 were not prepared.
2 Year 1999 emissions were last re-calculated using EDMSv4.21 in the *2004 ESPR* Air Quality Analysis.
3 Year 2006 emissions are computed using the most recent version of EDMS (version 5.0.1) and the previous version (version 4.5) for comparison to 2005 results.
4 Beginning in 1996 and later, emissions include vehicles and equipment converted to alternative fuels.
5 Updates to the EDMS resulted in an increase of GSE VOC emissions between 2001 and 2002 as the result of new emission factors from the NONROAD emission factor database.
6 The 2006 increase in aircraft VOC emissions is largely attributable to the addition of aircraft main engine startup emissions; a feature of EDMS (v5.0.1) that did not exist in prior versions.
7 Due to the new roadway configuration and opening of the Ted Williams Tunnel there was no Ted Williams Tunnel through-traffic at Logan Airport beginning in 2003.
8 1999 – 2006 include reductions attributable to CNG shuttle buses.
9 Includes the central heating and cooling plant, emergency electricity generation, and other stationary sources. Fire Training emissions were included in 1999, and 2003 through 2006. Diesel snow melter usage was added in 1999, and 2004 through 2006.
10 The change in total VOC emissions for 2006 as compared to 2005 are attributable to the addition of aircraft main engine startup emissions in EDMS (v5.0.1) and the updated GSE emissions factors from the NONROAD2005 emission factors database.

Oxides of Nitrogen

In 2006, total NO_x emissions from all airport-related sources were estimated to be approximately 1,670 tpy (4,151 kg/day), which is a decrease of approximately one percent from 2005 levels and a 28 percent decrease compared to 1999 levels, the benchmark of the AQI which is discussed later in this chapter. Figure 7-3 depicts these short- and long-term trends in NO_x emissions, and Table 7-5 shows the allotment for each emission source over this time period. Other findings include the following:

- When compared to 2005 levels, total aircraft-related NO_x emissions were higher in 2006 by 4 percent. This increase is due to generally longer aircraft times-in-mode in EDMSv5.0.1 and longer reported taxi and delay times at Logan Airport in 2006 when compared to 2005.[8]
- GSE emissions of NO_x decreased by approximately 4 percent in 2006 compared to 2005 due to the change in the aircraft fleet mix and updated GSE emission factors using NONROAD2005.
- NO_x emissions from motor vehicles decreased by approximately 12 percent from 2005 levels. This reduction in motor vehicle emissions is attributable to the lower emission factors of the 2006 motor vehicle fleet and a slight increase in assumed VMT.[9]
- Stationary sources show a decrease of 50 percent in NO_x emissions in 2006 compared to 2005. This is largely based on the overall reduction in fuel throughput, particularly No. 6 fuel oil.

Figure 7-3 Emissions of NO_x at Logan Airport



* Other sources include stationary sources (e.g., central heating and cooling plant, snow melter usage, fire training, etc.).

8 Taxi –in and taxi-out and delay times were obtained from the FAA Aviation System Performance Metrics (ASPM) database for 2006 (www.apo.data.faa.gov/).
9 Due to the closure of the tunnel for a period in 2006, VMT were not available. For the purposes of the analysis, 2005 VMT data were extrapolated to 2006 using the same percentage as passenger growth between 2005 and 2006.

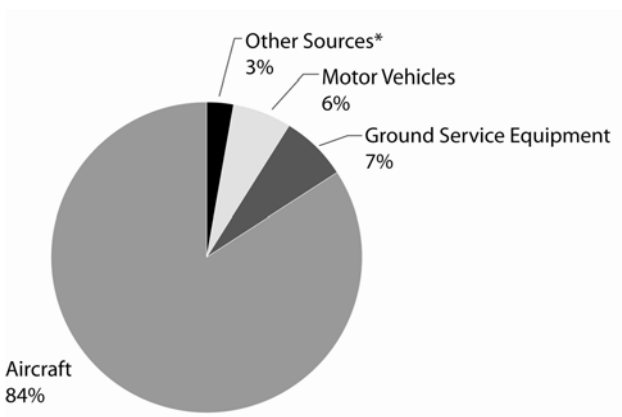
Table 7-5 Estimated NO_X Emissions (in kg/day) at Logan Airport[1]

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999[2]	2000	2001	2002	2003	2004	2005	2006[3]	
Aircraft/GSE Model	**Logan Dispersion Modeling System (LDMS)**								**EDMS 3.22**	**EDMS 4.21**	**EDMS 4.03**		**EDMS 4.11**		**EDMS 4.21**	**EDMS 4.5**		**EDMS 5.0.1**
Motor Vehicle Model	**MOBILE5a**								**MOB5a_h**	**MOB6.2.03**	**MOB6.0**			**MOB6.2.01**	**MOB6.2.03**			
Aircraft Sources																		
Air carriers	4,554			4,271	4,317	3,861	3,781	4,150	4,471	4,183	4,202	3,707	2,721	2,479	2,949	2,880	2,849	**3,044**
Commuter aircraft	133			202	158	192	137	159	203	166	125	233[2]	208	185	245	225	195	**256**
Cargo aircraft	237			213	257	332	363	262	254	286	284	267	246	213	215	211	192	**125**
General aviation	13			13	13	17	18	21	5	12	49	34	38	45	49	50	49	**60**
Total aircraft sources	4,937			4,699	4,745	4,402	4,389	4,592	4,933	4,647	4,660	4,241	3,212	2,922	3,458	3,366	3,285	**3,485**
Ground Service Equipment[4]	603			722	617	607	588	622	317	444	333	305	322[5]	291	333	312	280	**300**
Motor Vehicles																		
Ted Williams Tunnel through-traffic	NA			NA	NA	NA	NA	NA	NA	28	26	22	20	0[6]	0[6]	0[6]	0[6]	**0[6]**
Parking/curbside	25			25	24	24	24	24	37	39	52	46	32	28	21	22	19	**19**
On-airport vehicles[7]	232			240	239	229	257	244	372	449	425	369	341	302	267	269	238	**238**
Total motor vehicle sources	257			265	263	253	281	268	409	516	503	437	393	330	288	291	257	**257**
Other Sources																		
Fuel storage/handling[8]	0			0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Miscellaneous sources[9]	344			278	330	320	275	244	284	165	211	185	175	151	211	218	109	**109**
Total other sources	344			278	330	320	275	244	284	165	211	185	175	151	211	218	109	**109**
Total Airport Sources	6,141	NA	NA	5,964	5,955	5,582	5,533	5,726	5,943	5,772	5,707	5,168	4,103	3,694	4,290	4,187	3,931	**4,151**

kg/day kilograms per day. 1 kg/day is approximately equivalent to 0.40234 tons per year (tpy).
NA Information not available.
MOB MOBILE model for motor vehicle emissions (MOB5a_h=MOBILE5a_h, MOB6.2=MOBILE6.2 version .01 or version .03).
1 The emissions inventory for 1990 is shown in the 2005 EDR. Emission inventories for 1991 and 1992 were not prepared.
2 Year 1999 emissions were last re-calculated using EDMSv4.21 in the 2004 ESPR Air Quality Analysis.
3 Year 2006 emissions are computed using the most recent version of EDMS (version 5.0.1) and the previous version (version 4.5) for comparison to 2005 results.
4 Beginning in 1996 and later, emissions include vehicles and equipment converted to alternative fuels.
5 Updates to the EDMS resulted in an increase of GSE NOx emissions between 2001 and 2002 as the result of new emission factors from the NONROAD emission factor database.
6 Due to the new roadway configuration and opening of the Ted Williams Tunnel there was no Ted Williams Tunnel through-traffic at Logan Airport beginning in 2003.
7 1999 – 2006 include reductions attributable to CNG shuttle buses.
8 Fuel storage and handling facilities are not sources of NOx emissions.
9 Includes the central heating and cooling plant, emergency electricity generation, and other stationary sources. Fire Training emissions were included in 1999, and 2003 through 2006. Diesel snow melter usage was added in 1999, and 2004 through 2006.

As shown in Figure 7-4, in 2006, aircraft continued to represent the largest source (84 percent) of NO_x at Logan Airport, followed by GSE (seven percent), motor vehicles (six percent), and stationary sources (three percent). Finally, the results for 2006 contained in Table 7-5 reveal a six percent increase in the NO_x emissions inventory results between EDMS versions 4.5 and 5.0.1. This difference is attributed to EDMSv5.0.1 having longer aircraft times-in-mode and updated GSE emission factors when compared to the previous version.

Figure 7-4 Sources of NO_x Emissions in 2006



* Other sources include stationary sources (e.g., central heating and cooling plant, snow melter usage, fire training, etc.).

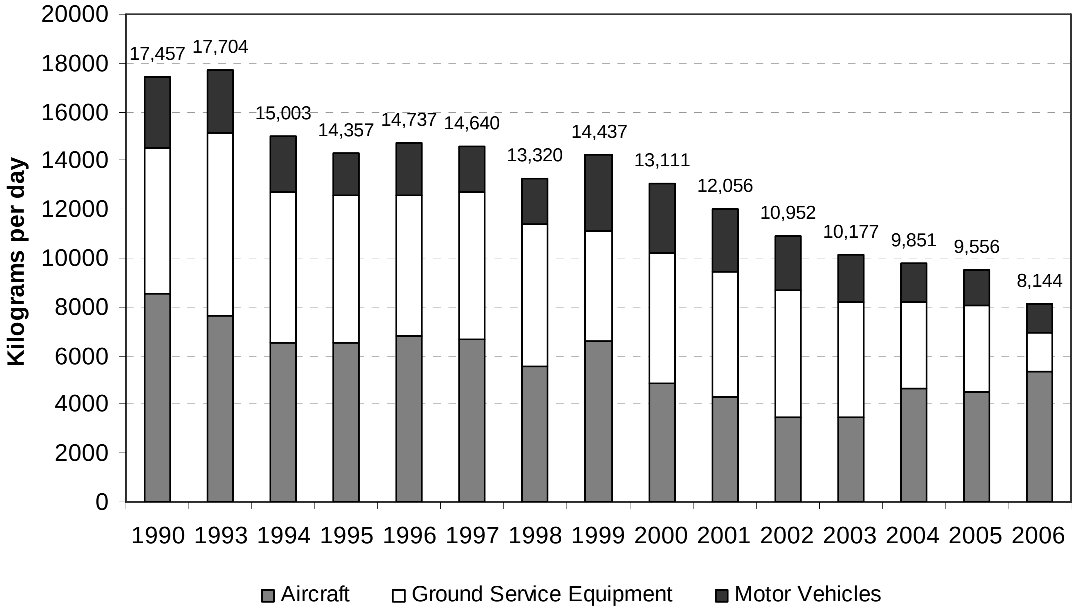
Carbon Monoxide

Total CO emissions at Logan Airport in 2006 were approximately 3,277 tpy (8,144 kg/day), or 15 percent lower than 2005 levels. Figure 7-5 depicts a long-term downward trend in CO emissions at the Airport and Table 7-6 shows the breakdown of these emissions, by source category. Other findings of the analysis include the following:

- Aircraft-related CO emissions increased in 2006 by 19 percent compared to 2005 levels due to generally longer aircraft times-in-mode in EDMSv5.0.1 and higher reported taxi and delay times at Logan Airport in 2006 as compared to 2005.[10]
- GSE CO emissions decreased by 55 percent in 2006 mostly due to changes in aircraft fleet mix and updated GSE emission factors using NONROAD2005.
- CO emissions from motor vehicles declined in 2006 by approximately 20 percent from 2005 levels. The reduction in motor vehicle emissions of CO is attributable to the lower emission factors of the motor vehicle fleet in 2006.
- Stationary source emissions of CO decreased by 40 percent in 2006 compared to 2005 largely based on the overall reduction in fuel throughput, particularly No. 6 fuel oil.

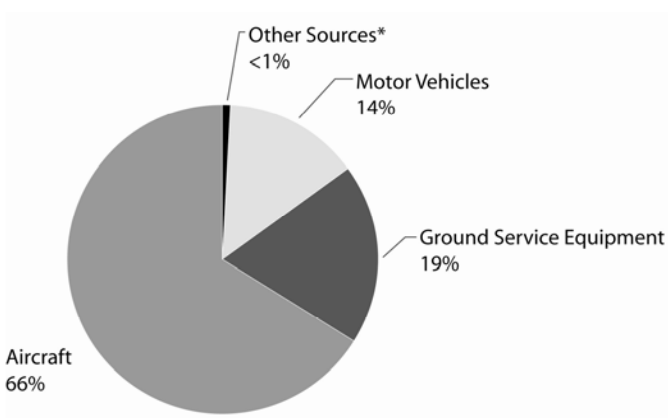
10 Taxi –in and taxi-out and delay times were obtained from the FAA Aviation System Performance Metrics (ASPM) database for 2006 (www.apo.data.faa.gov/).

Figure 7-5 Emissions of CO at Logan Airport



As shown in Figure 7-6, aircraft continued to represent the largest source (66 percent) of CO at Logan Airport in 2006, followed by GSE (19 percent), motor vehicles (14 percent), and stationary sources (less than one percent). Finally, the results for 2006 contained in Table 7-6 reveal an approximately nine percent decrease in the CO emissions inventory results between EDMS versions 4.5 and 5.0.1. This difference is attributed to EDMSv5.0.1, having longer aircraft times-in-mode and updated GSE emission factors when compared to the previous version. Although aircraft CO emissions increase due to longer times-in-mode, this is more than offset by the decrease in GSE CO emissions as a result of EDMS using the new NONROAD2005 emission factors. The net result is that total CO emissions decrease by nine percent between EDMS versions 4.5 and 5.0.1.

Figure 7-6 Sources of CO Emissions in 2006



* Other sources include stationary sources (e.g., central heating and cooling plant, snow melter usage, fire training, etc.).

Table 7-6 Estimated CO Emissions (in kg/day) at Logan Airport[1]

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999[2]	2000	2001	2002	2003	2004	2005	2006[3]	
Aircraft/GSE Model	**Logan Dispersion Modeling System (LDMS)**								**EDMS 3.22**	**EDMS 4.21**	**EDMS 4.03**		**EDMS 4.11**		**EDMS 4.21**	**EDMS 4.5**		**EDMS 5.0.1**
Motor Vehicle Model	**MOBILE5a**								**MOB5a_h**	**MOB6.2.03**	**MOBILE6.0**			**MOB6.2.01**	**MOB6.2.03**			
Aircraft Sources																		
Air carriers	6,613			5,663	4,660	4,691	4,812	4,698	3,079	3,754	2,994	2,475	2,156	2,128	2,985	2,895	2,828	**3,167**
Commuter aircraft	977			1,309	927	934	859	770	482	1,404	1,188	1,072	783	846	1,010	1,010	950	**1,587**
Cargo aircraft	576			344	572	598	580	514	218	503	400	323	285	209	229	174	138	**158**
General aviation	352			353	356	339	549	654	269	940	295	407	256	276	416	437	398	**442**
Total aircraft sources	8,518			7,669	6,515	6,562	6,800	6,636	4,048	6,601	4,876	4,277	3,480	3,459	4,640	4,516	4,314	**5,354**
Ground Service Equipment[4]	6,001			7,482	6,187	6,029	5,740	6,098	5,113	4,532	5,335	5,193	5,170	4,758	3,586	3,531	3,409	**1,586**
Motor Vehicles																		
Ted Williams Tunnel through-traffic	NA			NA	NA	NA	NA	NA	NA	151	133	121	112	0[5]	0[5]	0[5]	0[5]	**0**[5]
Parking/curbside	1,218			952	820	650	644	586	772	437	495	440	295	253	180	179	144	**144**
On-airport vehicles[6]	1,689			1,575	1,451	1,087	1,514	1,283	1,883	2,547	2,245	2,001	1,872	1,685	1,412	1,290	1,036	**1,036**
Total motor vehicle sources	2,907			2,527	2,271	1,737	2,158	1,869	2,655	3,135	2,873	2,562	2,279	1,938	1,592	1,469	1,180	**1,180**
Other Sources																		
Fuel storage/handling[7]	0			0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Miscellaneous sources[8]	31			26	30	29	39	37	37	168	27	24	23	22	33	40	24	**24**
Total other sources	31			26	30	29	39	37	37	168	27	24	23	22	33	40	24	**24**
Total Airport Sources	17,457	NA	NA	17,704	15,003	14,357	14,737	14,640	11,853	14,436	13,111	12,056	10,952	10,177	9,851	9,556	8,927	**8,144**

kg/day kilograms per day. 1 kg/day is approximately equivalent to 0.40234 tons per year (tpy).
NA Information not available.
MOB MOBILE model for motor vehicle emissions (MOB5a_h=MOBILE5a_h, MOB6.2=MOBILE6.2 version .01 or version .03).
1 The emissions inventory for 1990 is shown in the *2005 EDR* legible. Emission inventories for 1991 and 1992 were not prepared.
2 Year 1999 emissions were last re-calculated using EDMSv4.21 in the *2004 ESPR* Air Quality Analysis.
3 Year 2006 emissions are computed using the most recent version of EDMS (version 5.0.1) and the previous version (version 4.5) for comparison to 2005 results.
4 Beginning in 1996 and later, emissions include vehicles and equipment converted to alternative fuels.
5 Due to the new roadway configuration and opening of the Ted Williams Tunnel there was no Ted Williams Tunnel through-traffic at Logan Airport beginning in 2003.
6 1999 – 2006 include reductions attributable to CNG shuttle buses.
7 Fuel storage and handling facilities are not sources of CO emissions.
8 Includes the central heating and cooling plant, emergency electricity generation, and other stationary sources. Fire Training emissions were included in 1999, and 2003 through 2006. Diesel snow melter usage was added in 1999, and 2004 through 2006.

Particulate Matter

Table 7-7 shows that total $PM_{10}/PM_{2.5}$ emissions at Logan Airport in 2006 were approximately 31 tpy (78 kg/day) or 7 percent lower than 2005 levels. For this analysis, all PM_{10} emissions are classified as $PM_{2.5}$, which is a conservative estimation for sources such as GSE, motor vehicles, and boilers: Measurements of PM from aircraft engines indicate that most of the particles are less than 2.5 microns in diameter ($PM_{2.5}$).[11] Generally, for other emission sources such as GSE, boilers, and motor vehicles, $PM_{2.5}$ is a fraction of the PM_{10}. Other findings of the analysis include the following:

- Aircraft-related $PM_{10}/PM_{2.5}$ emissions increased in 2006 by approximately 47 percent compared to 2005 levels largely due to the updated method by which EDMSv5.0.1 uses to estimate $PM_{10}/PM_{2.5}$ emissions (FOA3), the addition of main engine start-up emissions, generally longer aircraft times-in-mode in EDMSv5.0.1, and higher reported taxi and delay times in 2006 when compared to 2005. When using the prior version of EDMS (v4.5), aircraft emissions of $PM_{10}/PM_{2.5}$ are shown to increase by only 3 percent in 2006 compared to 2005.
- GSE $PM_{10}/PM_{2.5}$ emissions decreased by approximately 18 percent in 2006 mostly due to updated GSE emission factors using NONROAD2005.
- $PM_{10}/PM_{2.5}$ emissions from motor vehicles did not change significantly from 2005 to 2006.
- Stationary source emissions of $PM_{10}/PM_{2.5}$ decreased by approximately 7 percent in 2006 compared to 2005 largely due to the overall reduction in fuel throughput, particularly No. 6 fuel oil.

As shown in Figure 7-7, aircraft represent the largest (56 percent) source of $PM_{10}/PM_{2.5}$ followed by stationary sources (e.g., central heating and cooling plant, snow melter usage, fire training, etc.) (21 percent), GSE (12 percent), and motor vehicles (12 percent). Finally, the results for 2006 contained in Table 7-7 reveal an approximately 20 percent increase in the $PM_{10}/PM_{2.5}$ emissions inventory results between EDMS versions 4.5 and 5.0.1. Again, this difference is largely attributed to EDMSv5.0.1 using FOA3 to estimate aircraft $PM_{10}/PM_{2.5}$ emissions.

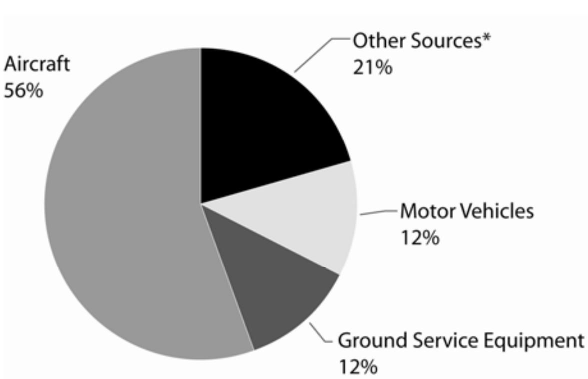
11 Making the assumption that all particles are less than 2.5 microns in diameter is consistent with the Aircraft Particle Emissions eXperiment (APEX), www.particles.grc.nasa.gov/apex.html.

Table 7-7 Estimated $PM_{10}/PM_{2.5}$ Emissions (in kg/day) at Logan Airport[1]

	2005[2]	2006[3]	
Aircraft/GSE Model	**EDMS 4.5**		**EDMS 5.0.1**
Motor Vehicle Model	**MOBILE6.2.0[3]**		
Aircraft Sources			
Air carriers	25	25	38
Commuter aircraft	1	1	2
Cargo aircraft	2	3	2
General aviation	2	2	2
Total aircraft sources	30	31	44
Ground Service Equipment4	**11**	**9**	**9**
Motor Vehicles			
Ted Williams Tunnel through-traffic[5]	0	0	0
Parking/curbside	1	1	1
On-airport vehicles[6]	8	8	8
Total motor vehicle sources	9	9	9
Other Sources			
Fuel storage/handling[7]	0	0	0
Miscellaneous sources[8]	34	16	16
Total other sources	34	16	16
Total Airport Sources	**84**	**65**	**78**

kg/day kilograms per day. 1 kg/day is approximately equivalent to 0.40234 tons per year (tpy).
1 It is assumed that all PM are less than 2.5 microns in diameter ($PM_{2.5}$).
2 2005 is the first year that $PM10/PM_{2.5}$ emissions were included in the Logan ESPR/EDR emission inventories.
3 Year 2006 emissions are computed using the most recent version of EDMS (version 5.0.1) and the previous version (version 4.5) for comparison to 2005 results.
4 Beginning in 1996 and later, emissions include vehicles and equipment converted to alternative fuels.
5 Due to the new roadway configuration and opening of the Ted Williams Tunnel there was no Ted Williams Tunnel through-traffic at Logan Airport beginning in 2003.
6 Includes reductions attributable to CNG shuttle buses.
7 Fuel storage and handling facilities are not sources of PM emissions.
8 Includes the central heating and cooling plant, emergency electricity generation, fire training, snow melters, and other stationary sources.

Figure 7-7 Sources of $PM_{2.5}$ Emissions in 2006



* Other sources include stationary sources (e.g., central heating and cooling plant, snow melter usage, fire training, etc.). Does not total 100 percent due to rounding.

Measured NO_2 Concentrations

This section presents the results of Massport's ambient (i.e., outdoor) air quality monitoring program for NO_2, a pollutant associated with aircraft activity. Since 1982, Massport has been collecting NO_2 concentration data at numerous locations both on the Airport and in neighboring residential communities. The purpose of this monitoring program is to track long-term trends in NO_2 levels and to compare the results to the NAAQS for this pollutant.

The protocol for this monitoring program calls for the collection of samples using passive diffusion tube technology over a one-week period, every month of the year and at each of the monitoring stations. The samples, along with Quality Assurance/Quality Control (QA/QC) samples, are then analyzed in a laboratory.

Table 7-8 presents the 2006 NO_2 monitoring data in micrograms/cubic meter ($\mu g/m^3$) and Figure 7-8 depicts the locations of the 27 sites currently in the Massport NO_2 monitoring network. For comparative purposes, historic data from 1999 to 2005 are also shown in Table 7-5. The table also includes NO_2 data collected separately by the MDEP using continuous monitors at four Boston-area stations, none of which are located on, or adjacent to, Logan Airport.

As shown in Table 7-8, there is an ongoing trend of decreasing NO_2 concentrations at both the Massport and MDEP monitoring sites. Other observations of the 2006 data show that:

- Annual NO_2 concentrations at all monitoring locations were below the annual NO_2 NAAQS of 100 $\mu g/m^3$ in 2006.
- The highest NO_2 concentrations in 2006 occurred in areas characterized by high levels of motor vehicle traffic (i.e., former Logan Statue [Site 8] and Maverick Square [Site 12]).
- As in previous years, the 2006 NO_2 values in residential communities were generally lower than at the monitors located at the runway ends, with the exception of Site 4 (Runway 27).

Spatial and temporal changes in measured NO_2 levels from year to year are typical and should not be used to define short-term results. Rather, NO_2 levels should be assessed by looking at the results over a period of several years.

Table 7-8 Massport Annual NO_2 Concentration Monitoring Results (µg/m^3)

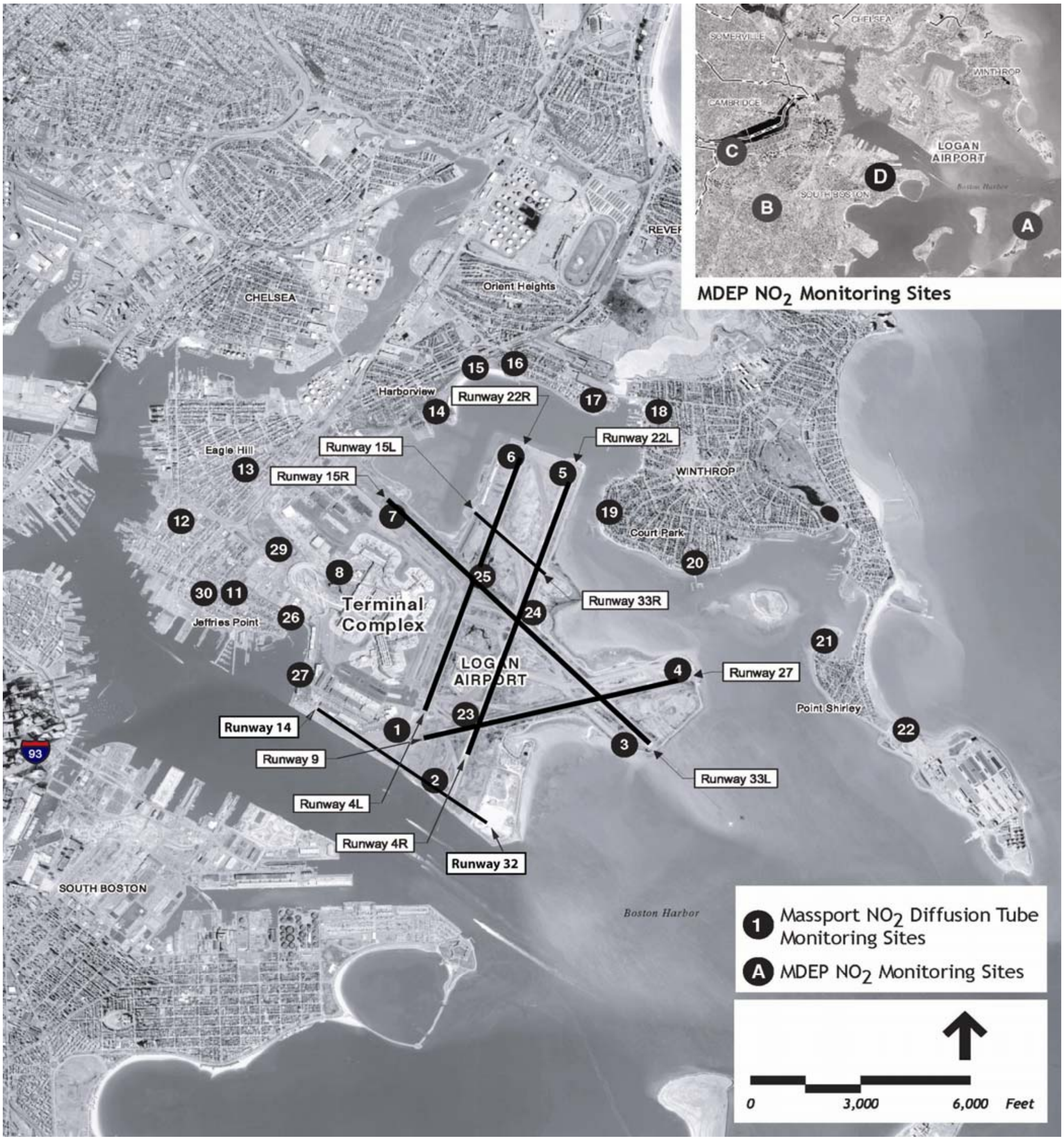
Monitoring Site	Site No.	Year							
		1999	2000	2001	2002	2003	2004	2005	2006
Massport Monitoring Sites									
Runway 9	**1**	61.0	58.2	41.6	45.8	33.9	30.1	35.0	**31.9**
Runway 4R	**2**	55.6	44.6	41.4	36.9	32.5	30.9	30.7	**29.0**
Runway 33L	**3**	47.7	42.6	39.4	33.3	30.8	25.4	24.5	**26.3**
Runway 27	**4**	42.9	37.8	35.8	30.3	25.5	24.1	22.7	**22.3**
Runaway 22L	**5**	47.5	39.8	38.2	33.8	27.8	23.7	22.1	**24.9**
Runway 22R	**6**	60.6	59.2	51.6	45.0	32.3	29.7	32.9	**25.1**
Runway 15R	**7**	47.0	43.4	44.3	42.6	40.8	28.7	27.7	**28.7**
Logan Statue	**8**	70.8	87.0	80.7	69.3	44.3	44.7	46.2	**43.5**
Webster St., Jeffries Point	**11**	52.4	45.5	43.4	39.1	32.5	28.3	31.3	**31.3**
Maverick Square, E. Boston	**12**	81.2	72.2	68.5	61.3	47.9	46.5	41.4	**45.6**
Bremen St., E. Boston	**13**	59.1	52.6	52.0	46.2	39.1	35.7	37.6	**37.1**
Shore St. E. Boston	**14**	45.7	38.5	38.8	35.0	27.2	24.0	24.9	**22.4**
Orient Heights Yacht Club	**15**	45.1	46.9	47.7	43.1	29.4	25.2	25.5	**25.1**
Bayswater St. E. Boston	**16**	45.2	45.5	48.3	41.2	28.4	22.8	30.4	**23.1**
Annavoy St. E. Boston	**17**	40.8	39.2	44.4	33.7	24.7	21.4	23.3	**21.0**
Pleasant St. Winthrop	**18**	42.0	39.3	37.8	32.3	27.9	22.6	23.4	**21.4**
Court Road, Winthrop	**19**	40.0	36.1	33.8	27.4	24.0	19.2	22.3	**21.0**
Cottage Park Yacht Club	**20**	37.1	50.9	45.9	36.7	22.5	19.1	27.7	**21.4**
Winthrop, Point Shirley	**21**	33.1	37.7	38.6	24.4	22.7	17.4	17.2	**20.2**
Deer Island	**22**	36.3	31.9	33.8	33.1	21.3	17.8	16.9	**17.8**
Runway 4R–9	**23**	42.2	66.0	42.3	33.4	28.6	24.1	27.1	**26.3**
Runway 33L–4R	**24**	44.3	41.7	41.8	33.5	28.1	24.3	22.3	**25.7**
Runway 22R–33L	**25**	62.4	50.3	49.4	42.2	33.8	31.7	29.4	**34.5**
Jeffries Point Park/Marginal St.	**26**	68.6	49.8	45.0	42.0	35.2	30.5	32.5	**31.7**
Harborwalk	**27**	54.3	48.5	47.4	43.5	35.6	35.5	29.3	**34.2**
Logan Athletic Fields	**29**	-	69.1	67.6	54.9	41.9	40.2	37.5	**37.0**
Brophy Park, Jeffries Point	**30**	-	48.0	45.2	41.0	36.5	31.2	32.9	**31.3**
Average of all Monitoring Sites		**50.5**	**50.5**	**47.5**	**40.0**	**31.7**	**28.0**	**28.7**	**28.7**
MDEP Monitoring Sites[1]									
Long Island Rd (MDEP)	**A**	20.7	24.4	22.6	22.6	16.9	12.6	13.2	**13.2**
Harrison Ave. (MDEP)	**B**	N/A	45.1	47.0	45.1	43.2	37.4	35.8	**35.8**
Kenmore Square (MDEP)	**C**	56.4	54.5	56.8	47.0	47.0	51.7	43.3	**43.3**
East First Street (MDEP)	**D**	39.5	37.6	43.2	39.5	39.5	36.8	33.9	**39.6**

Notes: The NAAQS is 100 µg/m^3.
The site identification labels in Figure 7-8 are keyed to the site labels in this table.

µg/m^3 micrograms/cubic meter.

1 NO_2 monitoring sites operated by the MDEP.

Figure 7-8 Massport NO_2 Monitoring Sites



Air Quality Emissions Reduction

As part of the in-place and ongoing Air Quality Management Plan, Massport has established a number of goals and objectives to address the impacts associated with air emissions from airport operations including the minimization of airport-related emissions through the AQI and the reduction of GSE and Massport fleet emissions with AFV. This section presents a 2006 update on the AQI and the AFV Program at Logan Airport.

Air Quality Initiative

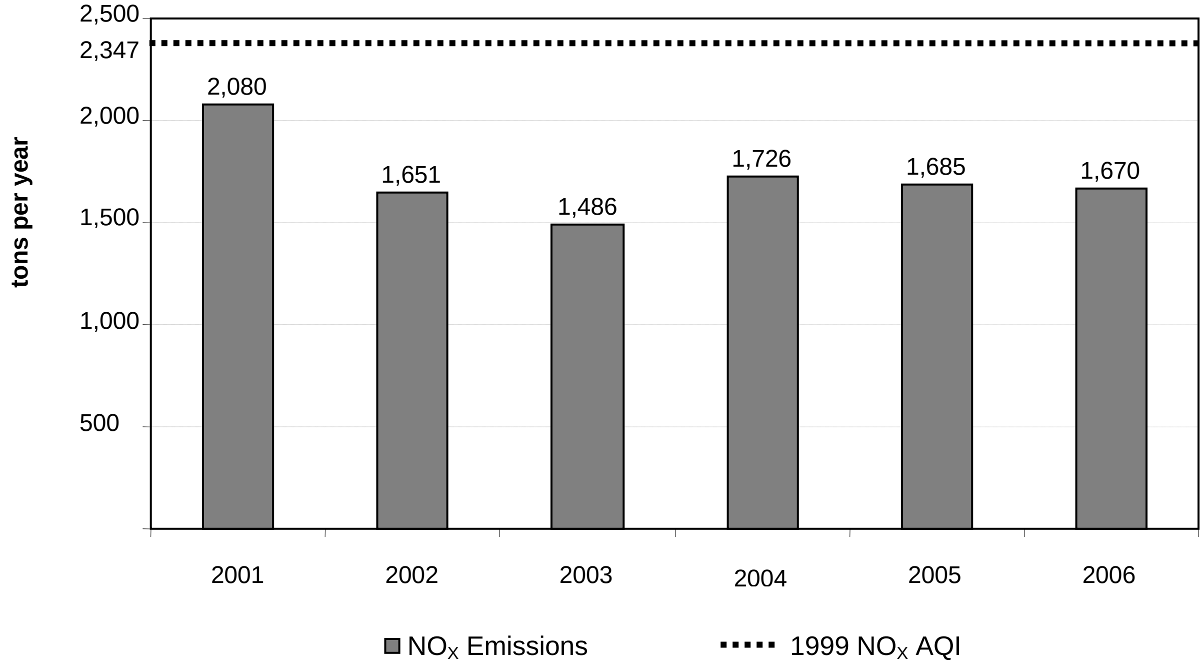
Massport developed the AQI as a 15-year voluntary program with the overall goal to maintain NO_x emissions associated with Logan Airport at, or below, 1999 levels. The AQI has four primary objectives, shown below, along with Massport's progress in meeting the AQI criteria.

- **Expand on the initiatives already in-place at Logan Airport.** See Table 7-9 provided below.
- **As necessary to maintain NO_x emissions at, or below, 1999 levels, retire emissions credits, giving priority to mobile sources.** Massport updates the Logan Airport inventory of NO_x emissions annually to reflect new information and changing conditions associated with the Airport's operations. Table 7-9 presents the updated emissions inventory and shows that, in 2006, it was not necessary to retire emission credits to maintain NO_x emissions at or below 1999 levels.
- **Report the status and progress of the AQI in the ESPR or EDR.** We do so here and have done so in each Logan EDR and ESPR since 2001.
- **Continue to work at international and national levels to decrease air emissions from aviation sources.** Massport maintains memberships and active participation in a number of organizations involved in addressing aviation-related environmental issues, including air quality. These include serving on environmental committees for the Transportation Research Board (TRB), American Association of Airport Executives (AAAE), and Airports Council International (ACI). Massport also hosted the University of California, Institute of Transportation Studies, Annual *Airport Noise and Air Quality Symposium* Planning Committee Meeting in June, 2006.

As shown in Table 7-9, NO_x emissions at Logan Airport in 2006 (net total with reductions) were approximately 677 tpy lower than 1999 levels. This represents a 29 percent decrease since 1999. Therefore, there was no need to purchase NO_x emissions credits in 2006 to meet the goals of the AQI. Between 1999 and 2006, the greatest reductions of NO_x emissions were associated with aircraft, GSE, and on-airport motor vehicles: 25 percent, 32 percent, and 50 percent reductions, respectively.

Figure 7-9 compares the 1999 threshold level of 2,347 tpy of NO_x emissions to modeled NO_x emissions for 2001 through 2006. Cumulatively, as of December 31, 2006, NO_x emissions at Logan Airport were approximately 3,861 tons below the benchmark set by the AQI. As shown in Table 7-9, based upon current projections, no credits will need to be purchased through the AQI period of 2015 since the emission inventory is projected to be below the 1999 threshold of 2,347 tpy through 2015.

Figure 7-9 NO_x Emissions Compared to AQI[1]



1 Includes emission reductions from the use of Alternative Fuel Vehicles/shuttle buses, and electric ground service equipment. (See Table 7-9).

As part of the reporting process, the AQI calls for an itemization of NO_x emissions generated by Logan Airport activities according to the individual airline operator. Table 7-10 shows the estimated amounts of NO_x air emissions generated by each airline in units of tons per year and tons per LTO. Each LTO consists of taxiing, queuing, takeoff, climb out, approach, and landing operations. Importantly, the comparison of air quality impacts based solely on emissions/LTO may not be directly relevant to any assessment of a specific airlines' overall environmental performance.

In August 2006, in an effort to reduce air quality emissions associated with aircraft taxiing, Massport sent letters to all airlines operating at Logan Airport encouraging the voluntary use of single-engine taxiing, consistent with safety, pilot judgment, and federal law (see *Appendix I, Air Quality/Emissions Reduction*). Massport staff periodically follows up with airlines on this request.

Table 7-9 AQI Inventory Tracking of NO_x Emissions (in tpy)[1] for Logan Airport

	Actual Conditions[2]								Forecasted Conditions[2]								
	1999[3]	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Total Annual Emissions	**2,347**[4]	2,315	2,097	1,665	1,499	1,745	1,703	1,688	1,850	1,885	1,920	1,955	1,991	2,026	2,061	2,096	2,131
Above (Below) 1999 Levels Before Reductions	NA	(32)	(250)	(682)	(848)	(602)	(644)	(659)	(497)	(462)	(427)	(392)	(356)	(321)	(286)	(251)	(216)
Potential Reductions/Increases[5]																	
Alternative Fuel Vehicles/Shuttle Bus[6]	(11)	(4)	(4)	(3)	(3)	(10)	(9)	(8)	(7)	(6)	(5)	(4)	(3)	(2)	(1)	0	1
Electric Ground Service Equipment	(14)	(14)	(13)	(11)	(10)	(9)	(9)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(11)	(11)	(11)
Total Potential Reductions	(25)	(19)	(17)	(14)	(13)	(19)	(18)	(18)	(17)	(16)	(15)	(14)	(13)	(13)	(12)	(11)	(10)
Above (Below) 1999 Levels After Reduction	NA	(51)	(267)	(696)	(861)	(621)	(662)	(677)	(514)	(478)	(442)	(406)	(370)	(334)	(298)	(262)	(226)
Credit Trading[7]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Net Total w/Reductions	2,322	2,296	2,080	1,651	1,486	1,726	1,685	1,670	1,834	1,870	1,905	1,941	1,977	2,013	2,049	2,085	2,121

Notes: Values in parentheses, such as "(250)" are negative values. Values without parentheses are positive values.
"NA" means not applicable.

1 For consistency with the AQI, the NO_x emission values in this table are reported in tons/year. The EDR/ESPR Emissions Inventory values are reported in kg/day. A conversion factor of 0.40234 is used to convert kg/day to tons/year.

2 1999 and 2004 analysis years were updated in the *2004 ESPR* using EDMSv4.21. The 2000 and 2001 analyses were completed using EDMSv4.03 and MOBILE6. The 2002 to 2003 analyses were completed using EDMSv4.11 and MOBILE6. The 2004 analysis was completed using EDMSv4.21 and MOBILE6.2.01. The 2005 analysis was completed using EDMSv4.5 and MOBILE6.2.03. The 2006 analysis was completed using EDMSv5.0.1 and MOBILE6.2.03. The years 2007 through 2015 were interpolated using the 2020 analysis provided in Table 7-9 of the *2004 ESPR*.

3 The year 1999 is the "baseline" year for the AQI. Thus, 2,347 tons/year is considered the AQI threshold for NO_x emissions.

4 The original value of 2,235 tons/year in the AQI was based on the *2001 EDR* results and EDMSv4.03. This value was updated in the *2004 ESPR* using EDMSv4.21.

5 Other initiatives that Massport and Logan Airport tenants may use for possible emission reductions include: Consolidated Car Rental Facility, central heating and cooling plant Boilers, 400-Hz power at gates and low NO_x fuels in Logan Express buses.

6 Massport's current plan for the conversion of GSE to alternative fuels is being re-evaluated based on the new diesel rule (2007). Therefore, to be conservative, GSE AFV credits were kept consistent and are based on the same percentages as the 2005 analysis.

7 Since the AQI threshold is not exceeded in 2006, nor are the emissions expected to exceed the threshold in the near future, no credits will need to be purchased in the immediate term. Emissions will be re-evaluated each year, with a revised projection for 2015 in the next *ESPR*.

Table 7-10 Contribution of NO_x Air Emissions by Airline in 2006 (Estimated)

	Total Emissions (tons/year)		Normalized Emissions (tons/LTO)		Total Emissions (tons/year)		Normalized Emissions (tons/LTO)
Air Carrier, by Airline	LTOs	NO_x	NO_x per LTO	Air Carrier, by Airline	LTOs	NO_x	NO_x per LTO
Aer Lingus	511	21.13	0.041	JetBlue	16,274	128.73	0.008
Aeromexico	105	1.19	0.011	Kitty Hawk Air Cargo	276	1.89	0.007
Air Canada[1]	5,812	13.79	0.002	Lufthansa	762	31.08	0.041
Air France	603	25.03	0.042	Mesa Airlines	1,910	5.03	0.003
Airtran Airways	9,880	88.03	0.009	Miami Air	57	0.49	0.009
Alaska Airlines	549	7.83	0.014	Midwest Airlines	2,143	18.19	0.008
Alitalia	404	11.01	0.027	North American	185	4.51	0.024
America West	2,110	24.30	0.012	Northwest Airlines[5]	6,649	64.00	0.010
American Airlines[2]	31,697	241.69	0.008	Other Cargo	5	0.11	0.022
Astar Air Cargo	573	4.80	0.008	Other Charter	51	0.51	0.010
British Airways	1,095	62.55	0.057	Other Commercial	2	0.01	0.005
Cape Air	13,639	0.70	<0.001	Other International	11	0.27	0.025
Capital Cargo International	204	1.71	0.008	Ryan International	121	1.12	0.009
Cargolux	36	1.15	0.032	SATA International	167	3.50	0.021
Cayman Airways	29	0.20	0.007	Skylink Aviation	249	0.05	<0.001
Champion Air	29	0.24	0.008	Spirit	342	2.84	0.008
Colgan Air	6,544	2.44	<0.001	Swissair	354	11.40	0.032
Continental[3]	11,135	46.71	0.004	TACA	124	1.32	0.011
Custom Air Transport	156	1.21	0.008	Trans States Airlines	305	1.05	0.003
Delta[4] Air Lines	36,221	207.31	0.006	United Airlines	10,576	107.09	0.010
Express.Net	11	0.09	0.008	UPS Airlines	677	7.90	0.012
Federal Express	2,271	31.57	0.014	U.S. Airways[6]	21,502	171.28	0.008
Finnair	25	0.28	0.011	Virgin Atlantic	363	13.47	0.037
GA	15,722	24.13	0.002	Xtra	97	0.89	0.009
Icelandair	474	6.32	0.013				
Independence Air	23	0.21	0.009	**Totals**	203,060	1,402.34	0.007

Notes: The "Other" Categories may include airlines with 10 or less operations.
Other Charter may include: Ameristar, Pace, Sky King, etc.
Other International may include: Aeroflot, Cathay Pacific, JAL, etc.
Normalized emissions are based on a Landing and Takeoff Cycle (LTO).
This list combines the major airlines with their commuters (i.e., ComAir with Delta Air Lines, American Eagle with American, etc.).

1 Includes Jazz.
2 Includes American Eagle.
3 Includes Commutair.
4 Includes Chautauqua and Comair.
5 Includes Pinnacle Airlines.
6 Includes Chautauqua, Air Wisconsin, Piedmont Airlines, Pennsylvania Commuter Airlines, PSA Airlines, and Republic Airlines.

Based on the information shown in Table 7-10, international carriers are the higher NO_x emitters per LTO because their longer stage lengths require aircraft equipped with larger and/or additional engines. Overall, international carriers emit 15 percent of the total aircraft NO_x emissions at Logan Airport. Other results include:

- Carriers with the greatest number of flights tended to generate the highest percentage of NO_x emissions
- Combined, the four largest air carriers (by LTO), emitted 53 percent of the aircraft NO_x emissions
- Commercial airlines (excludes cargo and GA) accounted for 95 percent of aircraft NO_x emissions
- Cargo aircraft operators accounted for approximately 4 percent of aircraft NO_x emissions
- General aviation aircraft accounted for approximately 2 percent of aircraft NO_x emissions

Alternative Fuel Vehicles Program

Another element of Massport's Air Quality Management initiative is the AFV Program. The AFV Program is designed to replace conventionally-fueled fleet with alternative fuel vehicles, when feasible, to help reduce emissions associated with Logan Airport operations. To support its fleet of alternative fueled vehicles, Massport has developed and maintains an electric vehicles infrastructure with numerous charging spaces and inductive chargers at key locations at the Airport. For the past 12 years, Massport has also had a privately operated CNG station on site (located on the north side of the Airport near the Economy Parking Lot). This station is the largest CNG station in New England, primarily supports Massport's fleet of 32 shuttle buses, and is open to the public. In 2006, the Logan Airport CNG station dispensed approximately 31,100 gallon-equivalents per month. Table 7-11 reports an estimate of the number of Massport AFVs by vehicle type and the number of vehicles Massport added to and removed from its fleet in 2006. In compiling these 2006 data, Massport identified possible inconsistencies in the alternative fuel vehicles data. To verify the data regarding AFV fleet composition, Massport will conduct a detailed audit of its alternative fuel vehicles and report its findings in the *2007 EDR.*

Table 7-11 Massport's Alternative Fuel Vehicle Fleet Inventory at Logan Airport as of December 31, 2006

Fuel Type	Vehicle	Number
Electric	Pool Vehicle	2
	Solectria Citivan Stepvan	2
	Off-road vehicles	28
	Minibus	1
Compressed Natural Gas (CNG)	Ford Crown Victoria	1
	Econoline Van	3
	Pick-Up Truck	6
	Honda Civic	3
	Shuttle Bus	32
	Wheelchair Lift Cut Away Bus	1
CNG/Electric Hybrid	Non-Road Vehicles	10
Gasoline/Electric Hybrid	Ford Escape	1
Propane	Non-Road Vehicles (Forklifts)	2
	Total	**93**
	Total acquired in 2006	**0**
	Total disposed of in 2006	**6**

Source: Massport.

No new AFVs were acquired in 2006. Three electric vans, two electric cars, and one CNG van were retired in 2006. Massport now operates 93 vehicles powered by natural gas, propane, or electricity, or operates hybrids powered by gasoline and alternative power sources. Massport articulated its vehicle procurement policy in 2006 that requires consideration of alternative fuel vehicles when purchases are made.

Air Quality Management Status

Massport's multifaceted air quality management program focuses on decreasing emissions, when feasible, from all airport-related sources, in addition to studying innovative means to achieve emissions reductions. Massport's air quality improvement goals, the measures proposed to accomplish them, and some 2006 milestones are presented in Table 7-12.

Table 7-12 Air Quality Management Plan Status

Air Quality Emissions Reduction Goals	Plan Elements	2006 Status
Reduce emissions from Massport fleet vehicles	Convert Massport fleet vehicles to electricity or compressed natural gas (CNG) by retrofitting or procurement.	Massport continues to procure alternative fuel vehicles (AFVs) and substitute them for conventionally fueled vehicles, when feasible. No new AFVs were purchased in 2006. However, Massport articulated a vehicle procurement policy in 2006 that requires consideration of alternative fuel vehicles when purchases are made. Six alternative fuel vehicles were retired in 2006. Massport uses the Energy Policy Act (EPAct) of 1992 to expedite Massport's AFV program. Under EPAct, Massport is required to purchase 75 percent of its light-duty vehicles as AFVs. Public safety vehicles are excluded from this requirement. Total accrued banked EPAct credits were 36 in 2006.
Encourage use of alternative-fuel vehicles by private fleet and airside service vehicle owners	Provide infrastructure to support alternative fuels including CNG and electricity.	Massport continues to operate New England's largest CNG station, which is open to the public. In 2006, the CNG station dispensed approximately 31,100 gallon equivalents per month, serving over 100 vehicles daily. Massport also continues to maintain an extensive electric vehicle charging infrastructure. The electric charging infrastructure includes 15 inductive charging stations and eight dedicated conductive charging parking spaces.
	Work with ground access fleet and airside service-vehicle owners to encourage conversion.	Massport encourages conversion to AFVs by others through such policies as 50 percent discounts in AFV ground access fees to taxis, limousines, limited "front-of-line" taxi pool privileges to hybrid and alternative fuel vehicles, and preferred parking for hybrid and alternative fuel vehicles at Logan Airport parking facilities.
	Use of pre-conditioned air (PCA) at new and renovated terminals and terminal gates.	100 percent of the gates have PCA and 400-Hz power. This reduces the need for APUs and, consequently, reduces associated emissions.

Table 7-12 Air Quality Management Plan Status (Continued)

Air Quality Emissions Reduction Goals	Plan Elements	2006 Status
Minimize emissions from motor vehicles	Implement a program to increase high occupancy vehicle (HOV) ridership by air passengers.	Overall HOV mode share (including transit) for air passengers increased from 25.8 percent in 1990 to 30.3 percent in 2004. Updated HOV mode share data will be based on the air passenger surveys conducted in 2007. Refer to *Chapter 5, Ground Transportation* for details.
	Expand the Logan Airport Employee Transportation Management Association (Logan TMA) for Airport employees.	The TMA provides commuting information to all Airport employees. Massport recently provided resources to revitalize the TMA and to provide greater outreach and benefits to members.
Minimize emissions from Construction Equipment	Incorporated Clean Air Construction Initiative (CACI) into major earthwork construction projects.	For all construction projects (i.e., Central Garage and Runway 14-32) heavy construction equipment is required to be retrofitted with diesel particulate filters or diesel oxidation catalysts in accordance with CACI.
Reduce emissions from fuel vapor loss	Provide state-of-the-art fuel storage and distribution equipment.	The Fuel Storage and Distribution System is in operation.
	Implement Tank Management Program.	Refer to *Chapter 8, Water Quality/Environmental Compliance and Management*. Tank management focuses on proper maintenance.
Reduce emissions from stationary sources	Employ Reasonable Available Control Technologies (RACT) for NO_x at Central Heating/Cooling Plant.	RACT policies have been implemented.
	Use alternative fuels in snow melters.	Ultra Low Sulfur Diesel (ULSD) fuel is used in all snow melters.
	Incorporate green building technologies and energy use reduction strategies.	Massport participates in the State Sustainability Program. Terminal A is Leadership in Energy and Environmental Design (LEED™)-Certified and Terminal E incorporates green building elements. An overview of sustainability initiatives is presented in *Chapter 1, Introduction/Executive Summary*.
Reduce aircraft emissions	Work with the FAA to study and implement airfield-improvement concepts and operational changes that may have air quality benefits.	Massport promoted such concepts through the *Logan Airside Improvements Planning Project Environmental Impact Report/Statement*.

In addition to measures described in Table 7-12, Massport, through its involvement in the Massachusetts Clean Cities Program, has supported the education of the general public with respect to sustainable transportation through its sponsorship of the Altwheels Transportation Festival since its inception in 2003.

Updates on Other Air Quality Initiatives

Massachusetts Department of Public Health Study

In 2004, the Massachusetts Legislature appropriated funds for the Department of Public Health (DPH) to undertake an assessment of potential health impacts of Logan Airport in the East Boston section of the city and any other communities located within a five-mile radius of the Airport. With the focus on noise and air quality, this study is currently underway and consists of an epidemiological survey combined with computer modeling of noise levels and air pollution concentrations. Massport has cooperated in this effort by providing DPH with airport operational data in support of the assessment. DPH's anticipated date for completing this report is 2008.

Massport Air Quality Monitoring Study

Massport is undertaking a 1.6 million dollar air quality study around Logan Airport in compliance with its Massachusetts Environmental Policy Act (MEPA) Section 61 findings in connection with the Logan Airside Improvements Project (LAIP). The goal of the study is to gather air quality data in the communities around Logan with an emphasis on toxic air pollutants. The study will be performed over two, 12-month periods using both real-time and time integrated monitoring methods and will include measurement of fine particulates, VOC, carbonyls, black carbon, and PAH. Monitoring will be performed at approximately ten (10) locations.

Statewide National and International Initiatives

Advancements on the national and international levels to decrease airport-related air emissions focused primarily on three initiatives in 2006: the improved quantification of PM and HAPs emissions from aircraft engines, the continued phasing-in of AFV, and the consideration of greenhouse gas (GHG) emissions. These initiatives are briefly described below.

Particulate Matter and Hazardous Air Pollutant Research
Conducted by the FAA/ National Aeronautics and Space Administration (NASA)/U.S. Army Corps of Engineers, research continues to measure PM and HAPs emissions from aircraft engines and to evaluate their potential health effects. Similarly, NASA continues its measurements to better characterize PM emissions from aircraft engines as part of its Aircraft Particle Emissions eXperiment (APEX). Massport continues to closely track these issues through its involvement in aviation industry organizations such as ACI and AEEE.

Alternative Fuel Vehicle Conversions
Airlines and other GSE users are continually replacing their older fossil-fueled vehicles and equipment with low- and no-emitting technologies. Airport-fleet vehicles are also being converted to alternative fuels. In response, GSE and automobile manufacturers are offering a wider selection of AFVs, many of which are designed specifically for airport use.

Participation in Climate Action Plan
Massport was one of 15 state agencies and authorities that participated in the development of the Climate Protection Plan: the Commonwealth's initial step towards reducing GHG. Specifically, Massport is participating on two of the Plan's teams: Transportation System Planning and Transportation Technologies and Operations, with a focus on GHG emission reductions associated with airport operations. Several reduction strategies that are already in place include the following:

- Include energy use and GHG emission data as criteria in transportation decisions
- Maintain and update public transit systems
- Expand programs to promote efficient travel
- Seek opportunities to reduce emissions at Logan Airport
- Improve aircraft movement efficiency
- Promote the use of cleaner vehicles and fuels in public transit fleets
- Continue to promote the use of clean diesel equipment on state-funded construction projects
- Eliminate unnecessary idling of buses
- Advocate aircraft efficiency at regional and national levels

The Executive Office of Energy and Environmental Affairs (EOEEA) *GHG Emissions Policy* (dated April 23, 2007) further recommends that certain projects undergoing MEPA review quantify the GHG emissions generated and identify measures to avoid, minimize, or mitigate such emissions. A MEPA Advisory Committee developed a draft standardized protocol for preparing GHG emissions analyses which was issued for public comment on July 11, 2007.

In support of this new MEPA initiative, Massport will prepare an emissions inventory of GHG at Logan Airport, consistent with the forthcoming guidance, to be updated annually starting in the *2007 EDR.*

Engagement in Aviation-Related Environmental Issues
Massport maintains memberships and active participation in a number of organizations involved in addressing aviation-related environmental issues, including air quality. These include serving on environmental committees for the TRB, AAAE, ACI, and Women in Transportation Seminar and symposia. Massport also hosted the University of California, Institute of Transportation Studies, Annual Airport Noise and Air Quality Symposium Planning Committee Meeting in June 2006.

Massport will continue to monitor these initiatives and will report on their progress in the *2007 EDR*.

8

Water Quality/ Environmental Compliance and Management

Introduction

Massport's approach to environmental management and compliance is a key component of Logan Airport's sustainability commitment. Through monitoring and documentation, environmental performance is assessed, allowing policies and programs to be developed, implemented, and evaluated.

Massport's primary water quality goal is to prevent or minimize pollutant discharges, thus limiting adverse water quality impacts associated with airport activities. Massport employs several protection programs to promote awareness of Massport and tenant activities that may impact surface and groundwater quality, including implementing best management practices (BMPs) for pollution prevention by Massport and its tenants. In addition, Massport voluntarily participates in the Massachusetts State Sustainability Program, continuing its commitment to operate Logan Airport in an environmentally-sound manner. Massport complies with the Massachusetts Contingency Plan (MCP) by monitoring fuel spillage and tracks the status of spill response actions. The MCP, codified as 310 Code of Massachusetts Regulations (CMR) 40, lays out a set of regulations that govern the reporting, assessment, and cleanup of spills of oil and hazardous materials in Massachusetts. Massport also implements a Tank Management Program, which includes a tank upgrade and replacement program. Information on Massport's Logan Airport Stormwater Pollution Prevention Plan (SWPPP), Spill Prevention Control and Countermeasure plan (SPCC), and the MCP are further detailed in this chapter.

The federal Clean Water Act requires permits for pollutant discharges into United States (U.S.) waters from a point source and for stormwater discharges associated with industrial activities. Massport holds permits under the U.S. Environmental Protection Agency's (EPA) National Pollutant Discharge Elimination System (NPDES) Program.

Massport's Environmental Management Unit is responsible for ensuring Massport's compliance with applicable state and federal environmental laws and regulations. It also promotes appropriate environmental practices through pollution prevention and remediation measures. The Unit works closely with all Massport departments and tenants. The Unit's environmental programs pertaining to water quality and environmental compliance and management include:

- Stormwater management
- Water quality management
- Massachusetts Contingency Plan compliance
- Storage tank compliance
- Compliance auditing and inspections
- Environmental Management System (EMS) implementation
- State Sustainability Program participation

Key Findings

Highlights for 2006 are:

- Of the 92 hazardous material spills in 2006, 11 (12 percent) were considered reportable (i.e., over 10 gallons) under the applicable environmental regulations. Jet fuel spills accounted for 65 (71 percent) of the total spills, with nine of the jet fuel spills exceeding 10 gallons. The remaining 27 spills (29 percent) involved gasoline, hydraulic oil, diesel fuel, and other substances, including two reportable spills.
- In 2006, only four of 332 outfall samples exceeded the regulatory limits. The West Outfall and the Maverick Street Outfall each had one sample which exceeded the 15 milligrams per liter (mg/L) National Pollutant Discharge Elimination System (NPDES) limit for oil and grease. The North Outfall had two samples which exceeded the 0.3 milliliters per liter (ml/L) daily maximum limit for settleable solids. This is an improvement compared to 2005, when eight samples exceeded the regulatory limits.
- In accordance with the Massachusetts Contingency Plan (MCP), Massport continues to assess, remediate, and bring to regulatory closure areas of subsurface contamination. In 2006, two of its five MCP sites were closed out, and Massport was working towards achieving regulatory closure of the three remaining MCP sites.

Stormwater Management

In 2006, Massport had two NPDES permits for Logan Airport, one for the Airport's four major outfalls (NPDES Permit MA0000787) and one for the Fire Training Facility (NPDES Permit MA 0032751) shown in Figure 8-1. The areas drained by the four major outfalls are Porter Street Drainage Area (130 acres); Maverick Street Drainage Area (34 acres); North Drainage Area (152 acres); and West Drainage Area (557 acres) (Table 8-1). These four areas are shown in Figure 8-1 and further detailed in Table 8-1. The North and West Outfalls have end-of-pipe pollution control facilities for the removal of debris and floating oils prior to discharge into

Boston Harbor. The Porter Street Outfall does not have end-of-pipe pollution control facilities because it is a combined sewer overflow for the Boston Water and Sewer Commission.

The EPA issued a new Final NPDES permit for Logan Airport on July 31, 2007, which is not yet in effect. Details of the permit requirements will be described in the *2007 Environmental Data Report (2007 EDR)*.

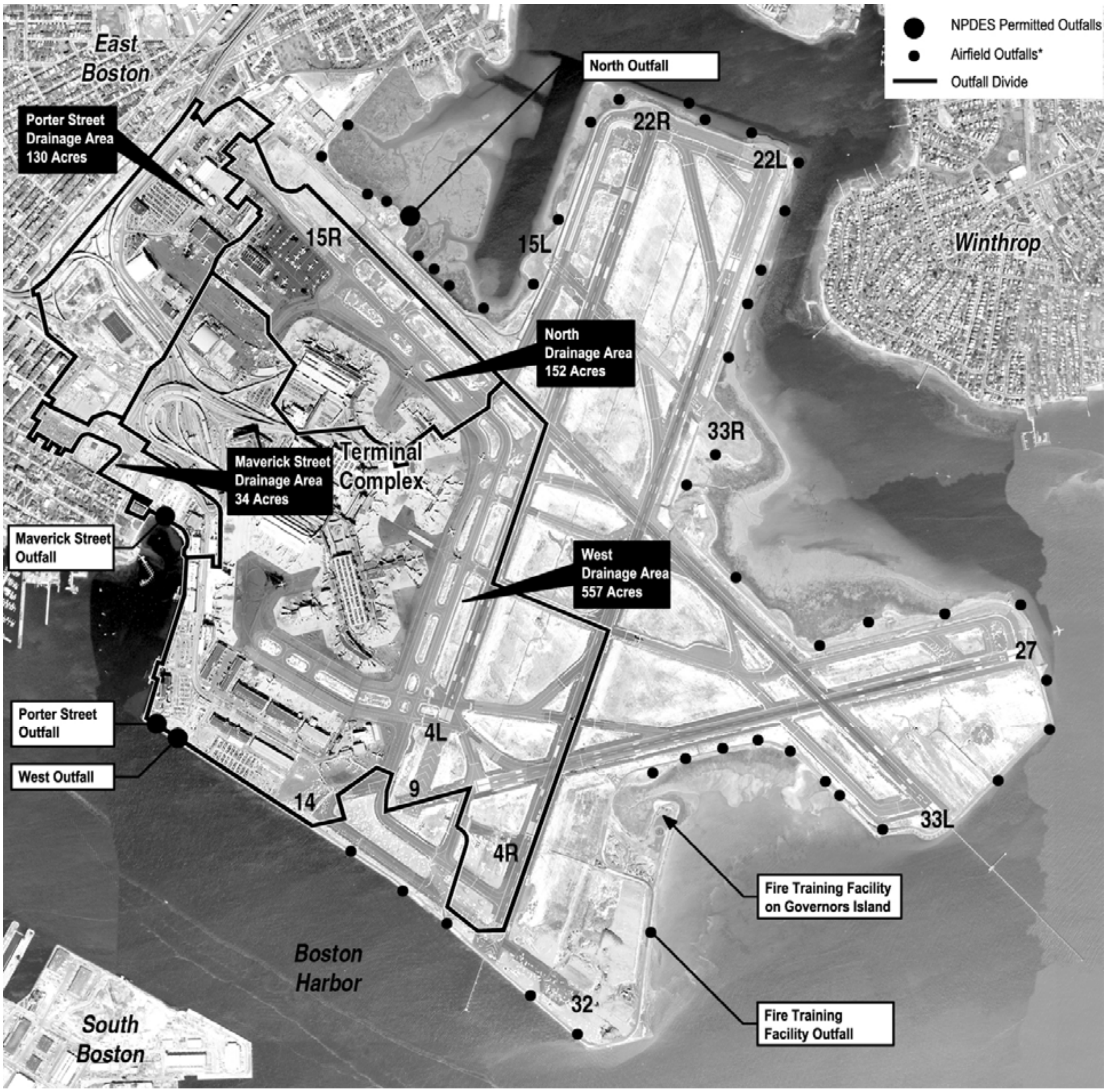
Table 8-1 Stormwater Outfalls Subject to NPDES Requirements

Outfall	Drainage Area (Acres)	Boston Harbor Discharge Location	Major Land Uses
North	152	Wood Island Bay	Terminal E, apron, taxiway, cargo areas, fuel farms
West	557	Bird Island Flats	Taxiways, terminal areas, aprons, cargo areas
Porter Street	130	Bird Island Flats	Hangars, vehicle maintenance facilities, cargo areas, car rental facilities, roadways
Maverick Street	34	Jeffries Cove	Car rental facilities, taxi/bus/limo pools, parking areas, flight kitchens

Stormwater Outfall NPDES Water Quality Sampling

To monitor permit compliance, water quality samples are collected three times a month at each permitted outfall. Discharge reports are submitted to the EPA and the Massachusetts Department of Environmental Protection (MDEP). As required by the NPDES permit, one sample is taken at each permitted outfall during a dry weather day, one is taken during a rainfall event, and one is taken within 24 hours after rainfall. Results are updated on Massport's website (www.massport.com) periodically. The four major outfalls handle most of the stormwater that is discharged from the areas at Logan Airport where fueling and maintenance activities are conducted. Table 8-2 summarizes the NPDES water quality sampling from 1993 through 2006 for the permitted outfalls. Table 8-2 shows that in 2006, the West Outfall and the Maverick Street Outfall each had one sample exceed the 15 milligrams per liter (mg/L) limit for oil and grease. Table 8-2 also shows that the North Outfall had two samples exceed the 0.3 milliliters per liter (ml/L) daily maximum limit for settleable solids. Due to the large size of the drainage areas and relatively low concentration of pollutants, it is typically not possible to trace exceedances to specific events. Where a known event, such as a spill, is reported, Massport routinely checks the drainage system for possible signs of a spill and takes corrective actions if necessary. Detailed water quality monitoring results for the permitted stormwater outfalls for 2006 are found in *Appendix J, Water Quality/ Environmental Compliance and Management.*

Figure 8-1 Logan Airport Outfalls



*Not included in NPDES permits in effect in 2006.
Note: Aerial photo taken February, 2006. Runway 14-32 construction completed in November, 2006.

Fire Training Facility NPDES Compliance

NPDES Permit No. MA0032751 regulates treated wastewater from the Fire Training Facility on Governors Island (Figure 8-1). The treated wastewater from fire training exercises is stored, treated by separation and a carbon filter to remove any contaminants, and is normally reused onsite. Discharge of treated wastewater to Boston Harbor is only necessary if no storage is available onsite. Treated wastewater is tested to ensure compliance with the NPDES permit prior to discharge. Discharge monitoring reports are submitted monthly to

the EPA. In 2006, Massport recycled all of the wastewater from the Fire Training Facility for fire training purposes. No changes are anticipated for the Fire Training Facility NPDES permit.

Table 8-2 Stormwater Outfall NPDES Water Quality Sampling

	1993	1994	1995	1996	1997	1998	1999	2000	2001[1]	2002	2003[1]	2004	2005	2006
Oil and Grease (mg/L)														
North Outfall	30/31	35/36	33/35	29/35	30/35	35/36	29/30	34/36	28/28	36/36	30/32	32/34	33/35	33/33
West Outfall	29/30	36/36	34/34	36/36	34/35	36/36	30/30	35/35	27/28	36/36	31/32	33/34	35/35	32/33
Porter Street Outfall	30/30	35/36	34/34	36/36	35/35	34/36	30/30	35/36	28//28	34/36	32/32	33/34	34/35	33/33
Maverick Street Outfall	29/29	36/36	35/35	36/36	35/35	35/36	30/30	34/34	26/28	35/36	32/32	34/34	35/35	32/33
Settleable Solids (ml/L)														
North Outfall	19/19	34/35	34/35	32/35	31/34	34/36	30/30	34/36	29/29	32/36	32/32	34/34	33/35	32/34
West Outfall	19/19	32/36	34/34	35/36	34/34	35/36	29/30	36/36	27/28	36/36	31/32	34/34	32/35	33/33
pH														
North Outfall	34/35	33/36	35/35	35/35	35/35	36/36	30/30	36/36	29/29	36/36	32/32	34/34	35/35	34/34
West Outfall	34/34	28/36	33/34	35/36	35/35	36/36	30/30	36/36	29/29	36/36	32/32	34/34	35/35	33/33
Porter Street Outfall	35/35	30/36	34/34	36/36	35/35	36/36	30/30	36/36	28/28	36/36	32/32	34/34	35/35	33/33
Maverick Street Outfall	35/35	35/36	35/35	36/36	34/35	36/36	30/30	35/35	28/28	36/36	32/32	34/34	35/35	33/33

1 In 2001 and 2003, exceptional weather, tidal conditions, or insufficient discharge precluded the collection of some samples, leading to a fewer number of samples collected than in other years.

Notes: A portion of the Porter Street Drainage Area was incorporated into the West Drainage Area as part of the roadway construction projects at Logan Airport.
30/32 = Number of samples at or below NPDES limits/Total number of samples taken.
Detailed sampling results for 2006 are provided in Table J-1 in *Appendix J, Water Quality/Environmental Compliance and Management*.

Fuel Use and Spills

Management of fueling operations at Logan Airport is designed to minimize impacts on water quality through the use of reliable storage, secondary containment, and effective spill clean-up procedures. Massport's jet fuel storage and distribution infrastructure, installed in 2000-2001, includes a state-of-the-art, zoned leak-detection system for underground fuel piping, which identifies volumetric changes of product in the pipe at operating pressure and zero pressure. The system combined the storage facility with a hydrant fuel system that reduced the need for trucks and dispensing.

This upgraded fuel storage and distribution system also allows for the reliable detection of leaks. The aboveground jet fuel storage facility and distribution system are operated by a single party, BOSFUEL, offering improved management and coordination. Considerable organization effort was put in place to minimize potential fuel spills and maximize water quality protection for the storage and distribution facilities. Cathodic protection, leak detection, secondary containment, and tank overfill protection methods such as alarms, inventory gauging sensors in the tanks, and emergency fuel shut-off systems have been installed. The operation and maintenance of these controls have been included in the Operation and Maintenance Manual used by BOSFUEL to operate and maintain the facility. Built-in environmental controls, unified operations, and the ongoing contingency planning provide heightened environmental protection and more efficient fuel handling operations than the previous system. The former fuel farms were removed in 2000.

The Massport Fire-Rescue Department keeps logs of all spills at Logan Airport. State environmental regulations require that oil spills of greater than 10 gallons in volume be reported to MDEP. Spills that enter storm drains must also be reported. Massport keeps records of all spills, including those less than the reportable threshold. In 2006, the lowest number of spills occured in the 16 years that the numbers have been reported. In 2006, of the 92 oil and hazardous material spills reported to the Logan Airport Fire-Rescue Department, 11 (12 percent) were considered reportable. Jet fuel spills accounted for 65 (71 percent) of the total spills, with nine of the jet fuel spills exceeding 10 gallons. The remaining 27 spills (29 percent) involved gasoline, hydraulic oil, diesel fuel, and other substances, including two reportable spills. A summary of Logan Airport jet fuel usage and spill records from 1990 to 2006 is presented in Table 8-3. Greater detail pertaining to type and quantity of the spills can be found in *Appendix J, Water Quality/Environmental Compliance and Management*.

Tank Management Program

Massport's Tank Management Program includes a tank upgrade and replacement program, which by the end of 1998 had brought all Massport-owned tanks into regulatory compliance, meeting federal and state upgrade deadlines. In 1993, Massport began a six-phase Storage Tank Modifications Construction program. In 2005, Massport completed Phases I through VI of the Storage Tank Modifications Construction work, upgrading several existing tanks. As a BMP, Massport will continue to upgrade older tanks and to monitor tank systems.

Massport is also implementing a successful tank release prevention strategy, which includes:

- A program of monthly inspections and minor repairs of all Massport-owned tanks, related piping, and tank monitoring systems.
- Annual Stage II Vapor Recovery testing of Massport's underground storage tank and piping systems. Stage II Vapor Recovery Systems collect gasoline vapors from vehicles' fuel tanks when customers dispense gasoline products into their vehicles at gasoline dispensing facilities. The Stage II system uses special nozzles and coaxial hoses at each gasoline pump to capture vapors from vehicle fuel tanks during the refueling process and re-route them to the station's storage tank(s).
- Annual inspections of all of Massport's aboveground storage tanks greater than 10,000 gallons in volume.
- Massport review of all proposed tenant tank upgrades, installations, and tank removals (under the Tenant Alteration Application process) to ensure compliance with applicable state and federal regulations and with Massport policy.
- Ongoing upgrade and maintenance of a GIS database that contains information on all storage tanks located on Massport property. For each tank, the database tracks location, permit status, compliance status with applicable tank regulations, and tank and monitoring system equipment summaries.

Massport also provides tenants with revised storage tank regulatory requirements and assists with tank permitting processes.

Table 8-3 Logan Airport Oil and Hazardous Material Spills[1] and Jet Fuel Handling

Year	Total Number of all Spills	Total Number of all Spills >10 gallons	Total Volume of all Spills (Gallons)	Estimated Volume of Jet Fuel Handled (Gallons)	Total Volume of Jet Fuel Spilled (Gallons)
1990	173	NA	NA	438,100,000	3,745
1991	186	NA	NA	NA	2,471
1992	195	NA	NA	NA	4,355
1993	188	NA	NA	451,900,000	3,131
1994	217	NA	NA	476,700,000	4,046
1995	161	NA	NA	309,200,000	21,412[2]
1996	159	NA	NA	346,700,000	1,321
1997	147	NA	NA	377,488,161	2,029[3]
1998	191	NA	NA	387,224,004	10,047[4]
1999	196	43	7,151	425,937,051	7,012[5]
2000	136	20	1,318	441,901,932	1,227
2001	139	37	1,924	416,748,819	1,771
2002	101	16	653	358,190,362	559
2003	128	19	10,364	319,439,910	10,188[6]
2004	126	18	894	373,996,141	574
2005	97	15	2,319	368,645,932	585
2006	**92**	**11**	**752**	**364,450,864**	**644**

Source: Massport Fire-Rescue Department.
NA Information not available.
1 Materials include: jet fuel, hydraulic oil, diesel fuel, gasoline, and other materials such as glycol and paint.
2 One tenant spill, which occurred on October 15, 1995, totaled 18,000 gallons (84 percent of the annual spill total). The spill did not enter the Airport's storm drain system.
3 On October 23, 1997, a fuel line on an aircraft failed, resulting in the release of approximately 2,500 gallons, all but 60 gallons of which were recovered in drums before reaching the ground. Only the 60 gallons is included in the 1997 total.
4 Includes a 7,200-gallon spill that was discovered on September 2, 1998, and a 1,300-gallon spill that occurred on June 3, 1998. Neither spill entered the Airport's storm drain system.
5 Includes a 5,000-gallon spill, none of which entered the Airport's storm drainage system.
6 One fuel spill comprised 9,460 gallons or 94 percent of the total volume of the MDEP/MCP reportable spills. The fuel spill was contained and did not enter the drainage system.

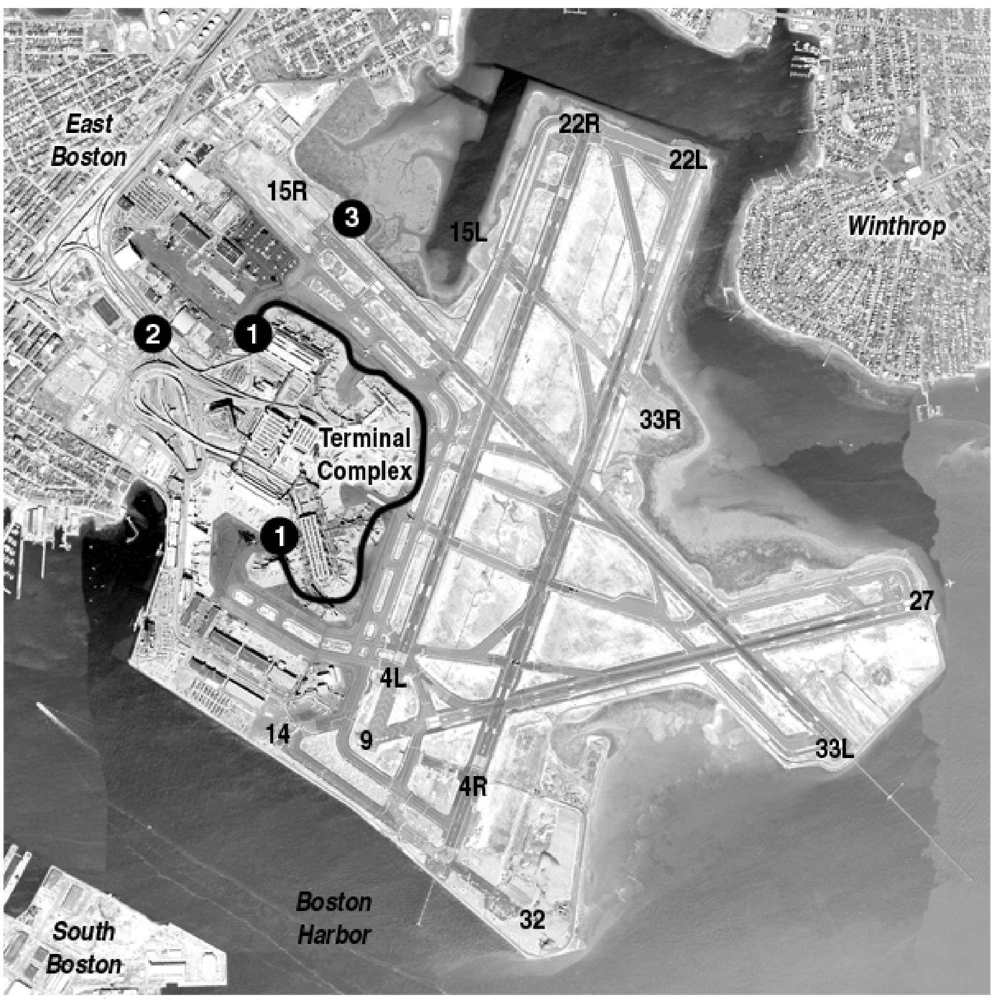
Site Assessment and Remediation

The MCP (310 CMR 40), which is administered by the MDEP, pertains to releases of oil or hazardous materials into the environment. The MCP prescribes the site cleanup process based on the nature and extent of the release's contamination. The MCP defines the roles for those parties affected by and potentially responsible for the release and establishes the release reporting program and submission deadlines for tracking events from initial release to regulatory closure.

In accordance with the MCP, Massport continues to assess, remediate, and bring to regulatory closure areas of subsurface contamination. There are a number of phases for the investigation of contaminated sites. Phase I involves initial site investigations for the presence of contamination and Phase II assessments are more comprehensive site investigations. Phase III identifies, evaluates, and selects remediation actions and Phase IV involves the implementation of selected remedial actions. Phase V involves the operation, maintenance and/or monitoring of the remediation program. Massport led the performance of a variety of response actions, including remediation at sites where Massport is the responsible party, where there are multiple responsible parties, and where no responsible party has been identified.

Table 8-4 describes Massport's progress in 2006 in achieving regulatory closure of the MCP sites identified in Figure 8-2. Previous MCP sites that have been addressed fully and require no further action, such as the groundwater contamination at Terminal A and at the Pan Am Fuel Farm, have been eliminated from the table.

Figure 8-2 Massachusetts Contingency Plan Sites



Notes: Site numbers are identified in Table 8-4.
Aerial photo taken February, 2006. Runway 14-32 construction completed in November, 2006.

Table 8-4 MCP Activities Status of Massport Sites at Logan Airport

Location (Release Tracking Number) and MDEP Reporting Status	Action/Status
1. Fuel Distribution System (3-1287)	
Phase II Report filed in April 1997	Indicated fuel floating on the groundwater table in 10 discrete locations in the terminal areas; cleanup required to achieve regulatory closure.
Phase III Report filed in April 1997	Reported product recovery as the preferred cleanup alternative; none of the areas to be cleaned up by a responsible party (i.e., a tenant responsible for the contamination). Cleanup was anticipated to span a minimum of three years.
Phase IV Remedy Implementation Plan filed in March 1998	The plan described seven discrete locations of separate phase hydrocarbons (jet fuel floating on the groundwater) to be remediated at Terminals C and E as well as three discrete areas at Terminal B to be remediated by tenants who were responsible for the historic release. The remediation strategies that Massport undertook at the seven areas differed depending on the product thickness. Strategies included trench-based product recovery, multi-phase extraction, excavation and dewatering during construction, and passive remediation.
Phase V Inspection and Monitoring Status Reports filed in September 1998, March 1999, and October 1999	The Status Reports documented remedial actions at seven areas including passive recovery of separate phase hydrocarbons (SPH) at Areas 1, 6, and 7, and pumping to recover SPH at Area 3. Interim passive recovery was also implemented at Areas 2 and 4, pending the evaluation of active recovery systems. Remedial objective of less than1/2 inch of product has been met at Areas 1, 2, 5, 6, and 7, but monitoring continues. MCP closure will be achieved at these areas by applying an AUL.
Tier II Extension Request submitted in March 2000	Site Closure was not achieved by the March 2000 deadline. A Tier II Extension Request was submitted, providing a plan for continued SPH recovery and monitoring until the remedial objective has been accomplished.
Response Action Outcome (RAO) Submitted March 2001	Under the Class C RAO, monitoring continues at this location along the fuel line for the presence of SPH.
Tier II Extension Request Submitted in July 2002	The Tier II Extension Request and RAM Plan were submitted prior to construction of the Baggage Screening Project in the area of the Fuel Distribution System.
2003	Massport submitted status reports detailing fuel recovery efforts along the distribution system.
2004	Massport submitted status reports to MDEP detailing fuel recovery efforts along the distribution system in March and September 2004.
2005	Inspection and Monitoring Status Reports were submitted to the MDEP in March 2005 and March 2006 detailing monitoring and product recovery efforts along the fuel distribution system during the period between September 2004 and September 2005.
2006 Update	*An Inspection and Monitoring Status Report was submitted to the MDEP detailing monitoring and product recovery efforts along the fuel distribution system (FDS) between March and September 2006. Massport continues to review data for tightness testing of the fuel line, and completed leak testing of fuel hydrants pits adjacent to Terminal B and Terminal C. Massport continues to meet with the operator of the FDS, BOSFUEL, to assess conditions along the FDS at Terminal B and Terminal C, referred to as the Retained Facilities portion of the FDS, and to coordinate the replacement of the Retained Facilities, which is scheduled for 2008.*

Notes: Abbreviations are defined at the end of this table. Refer to Figure 8-2 for location of MCP sites.

Table 8-4 MCP Activities Status of Massport Sites at Logan Airport (Continued)

Location (Release Tracking Number) and MDEP Reporting Status	Action/Status
2. Citgo Service Station (3-2616)	
Phase II Report filed in April 1997	Indicated soil and groundwater contamination exists; cleanup required to achieve regulatory closure.
Phase III Report filed in April 1997	Identified various alternatives that could be implemented to achieve closure. Underground storage tanks were removed by the CA/T Project during building demolition. Additional soil was removed during CA/T Project construction.
2002	Massport is preparing to close out this site following removal of petroleum-contaminated soil during CA/T project construction.
2003 and 2004	The CA/T Project has collected subsurface data necessary to close this site. Massport and the CA/T Project are evaluating the data and preparing the documentation required to close the site.
2005	The CA/T Project is preparing a final closure report for work that included excavating contaminated material in the area of the former Citgo Service Station.
2006 Update	*The CA/T Project completed a final closure report that covered the area of the former Citgo Service Station. Based on the assessment provided in the final closure report, Massport submitted a Class A-2 for this site in April 2007. No further action is required.*
3. North Outfall (3-4837)	
Phase II and Phase III Reports filed in March 1997	Indicated petroleum contamination present at the site is likely the result of decades of airport operation; risk assessment reported no significant risk to human health, or to the aquatic and avian community.
RAO submitted in March 1998	Class C RAO using a Temporary Solution (periodic site monitoring and assessment); remediation steps included (not limited to) installation of a new fuel distribution system and decommissioning of certain fuel lines, and natural biodegradation processes; goal is to have petroleum contamination reduced to an area less than 1,000 square feet. Installation of the new fuel distribution system and decommissioning of sections of the old system are completed. Massport has initiated site evaluation to document the reduction of petroleum contamination following the decommissioning of the North Fuel Farm and fuel distribution system.
Post RAO C evaluation report submitted in December 2002	Massport has eliminated substantial hazards at this site and has submitted a Class C RAO statement. In accordance with applicable regulations, Massport will conduct a periodic evaluation at five year intervals until a Permanent Solution has been achieved. The next periodic evaluation is scheduled for 2007.
2004	Evaluation report indicated that a "Condition of No Significant Risk" has not been achieved at this site. Massport will conduct another assessment in 2007.
2005	No change in status for 2005.
2006 Update	*Massport is preparing the five-year review of the Class C RAO for this site, which is due in December, 2007.*

Notes: This list includes Massport MCP sites only. Additional sites are the responsibility of Logan Airport tenants.
Italicized text denotes progress in 2006. Refer to Figure 8-2 for location of MCP sites.

AUL	Activity and Use Limitation	Phase I	Initial Site Investigation
MCP	Massachusetts Contingency Plan	Phase II	Comprehensive Site Assessment
RAM	Release Abatement Measure	Phase III	Identification, Evaluation, and Selection of Comprehensive Remedial Actions
RAO	Response Action Outcome	Phase IV	Implementation of Selected Remediation Action
SPH	Separate Phase Hydrocarbon	Phase V	Operation, Maintenance and/or Monitoring

Environmental Compliance and Management

Massport works to minimize environmental impacts at Logan Airport through ongoing programs and new initiatives. Massport's overall environmental compliance and management efforts address the following goals:

- Protect water quality Airport-wide
- Protect groundwater resources
- Protect surface water resources (Boston Harbor)
- Protect resources during construction
- Mitigate construction impacts
- Reduce occurrences of fuel leaks and spills
- Preserve coastal resources adjacent to the Airport

The progress report for environmental compliance in Table 8-5 summarizes Massport's mechanisms for implementing these goals and details where changes to these efforts occurred in 2006.

One noteworthy event in 2006 was the Leadership in Energy and Environmental Design (LEED™) certification of the new Terminal A by the U.S. Green Building Council. LEED™ certification recognizes buildings that incorporate positive environmental features and meet certain thresholds for sustainability and innovation. The LEED™ program encourages water efficiency, reduced energy consumption, the use of recycled materials, waste recycling, and improved indoor air quality. Logan Airport's Terminal A is the first airport terminal in the U.S. to achieve LEED™ certification. The terminal opened in 2005 and includes such features as:

- Reflective roofing and paving to reduce local temperatures and reduce cooling costs.
- Drip irrigation for landscaping, reducing irrigation demand by 50 percent.
- Low-flow lavatory fixtures and waterless urinals (in some areas), reducing restroom water use by 30 percent.
- Improved air quality due to the use of low-emitting materials such as paints, adhesives, and carpets.
- First-flush stormwater treatment to remove suspended solids and phosphorus from rain runoff before it discharges to Boston Harbor.
- A Ground Service Equipment electrification program to reduce fuel use.
- Bike racks and access to public transit to promote efficient, low-emissions access to the Airport.

Table 8-5 Progress Report for Environmental Management

Plan Elements	Progress Report for 2006
Environmental Compliance Inspections	In 2006, Massport performed tenant inspections and made recommendations suggesting how to rectify issues identified during the inspections. Tenants inspected included Signature Flight Support, Servisair, JetBlue, and AeroSnow.
Tenant Technical Assistance	Massport continued publication of *EnviroNews*, a quarterly newsletter that informs tenants of regulatory calendar milestones, permitting requirements, pollution prevention, BMPs; recommends use of sustainable materials; and provides information on Massport and other environmental requirements. Copies of the newsletters for quarters one through four are provided in *Appendix J, Water Quality/Environmental Compliance and Management*, and are also available on Massport's website at www.massport.com.
Stormwater Pollution Prevention Plan (SWPPP)	Massport encourages tenants to incorporate BMPs into their daily operations. Massport also inspected ramp operations to ensure compliance.
Construction Plans	Massport requires construction BMPs to be included in contracts. Massport uses a generic SWPPP for Logan Airport construction projects, which provides guidance and BMPs to control sedimentation and other pollutants from construction projects. Massport monitored construction projects at Logan Airport for compliance with project SWPPPs and regulatory requirements. For larger construction projects, Massport incorporates into project specifications a requirement to retrofit applicable construction equipment with pollution control devices such as diesel oxidation catalysts and/or particulate filters.
Spill Prevention Countermeasure and Control (SPCC)	Tenants meeting certain thresholds are required to prepare their own SPCC plans for their facilities. Massport checks for SPCC plans during its environmental compliance inspections. Additionally, tenants receive information on BMPs, which focus on spill management and prevention.

BMP Best Management Practices
SWPPP Stormwater Pollution Prevention Plan
SPCC Spill Prevention Countermeasure and Control

9

Project Mitigation Tracking

Introduction

This *2006 Environmental Data Report* (*2006 EDR*) provides a status report on Massport's mitigation commitments under the Massachusetts Environmental Policy Act (MEPA) for various airport projects. Each of these projects completed the state and federal environmental review processes and adopted a mitigation plan (Section 61 Findings).[1] Massport has in place a tracking program, the goal of which is to monitor Massport's and Logan Airport tenants' progress toward implementing and achieving their environmental mitigation commitments on schedule and according to the requirements set out in the Section 61 Findings for that specific project.

As each project moves forward through its construction phases, its mitigation plan is implemented with an ongoing tracking system to ensure compliance. This chapter provides Section 61 mitigation commitment updates in 2006 for projects for which mitigation is nearing completion or is ongoing (Tables 9-1 through 9-6).

Projects Nearing Completion of Mitigation Requirements

- Runway End Safety Improvements Project, Executive Office of Environmental Affairs (EOEA) #5122 (Project constructed except for the Runway 33L runway safety area enhancement, which is now a new project which will undergo separate environmental review according to federal and state requirements. Further enhancements are now being considered for the Runway 22R runway safety area).

Projects with Ongoing Mitigation

- West Garage Project, EOEA #9790 (Phase I complete. Phase II construction commenced in 2004 as an expansion to the Central Garage and was completed in early 2007).
- International Gateway Project, EOEA #9791 (Phase 1 of the facility opened in 2004).
- Replacement Terminal A Project, EOEA #12096 (Project opened March 16, 2005).
- Logan Airside Improvements Planning Project, EOEA# 10458 (Runway 14-32 construction commenced in 2004, and Runway 14-32 opened on November 23, 2006. The Centerfield Taxiway Improvements received a Federal Aviation Administration (FAA) Record of Decision in April 2007. Construction commenced in the fall of 2007).

1 Massachusetts General Law, Chapter 30, Section 61 (M.G.L. c. 30, § 61).

Projects Nearing Completion of Mitigation Requirements

Runway End Safety Improvements Project – EOEA #5122

Permitting History

- Certificate on the Final EIR issued on March 18, 1992
- Section 61 Findings submitted to EOEA August 10, 1992

Project Status

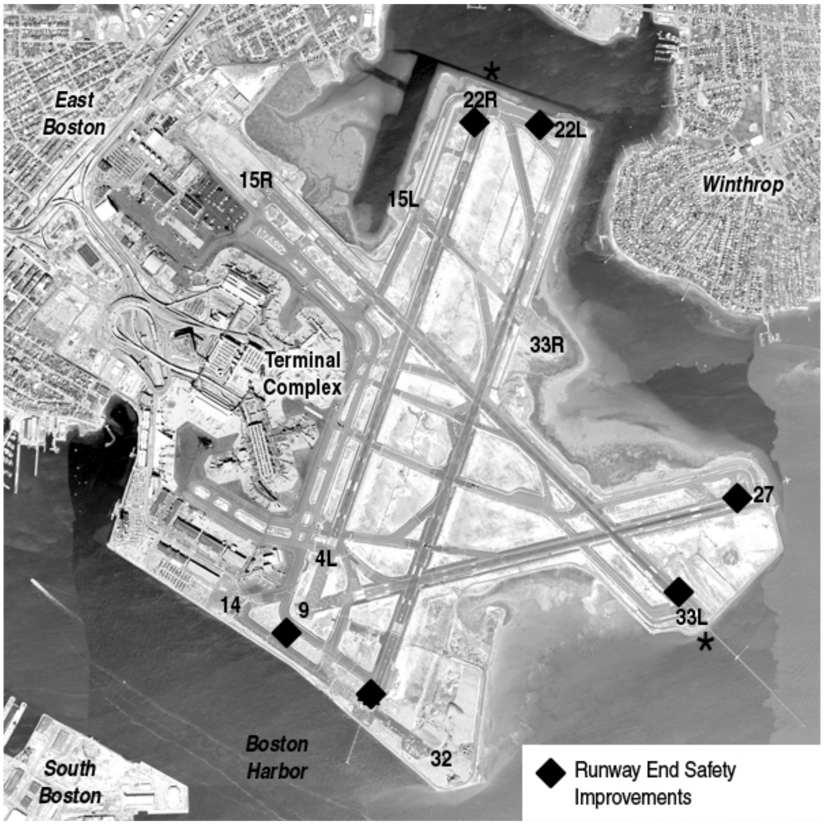
The Runway End Safety Improvement Project (Figure 9-1) consists of the creation of safety area enhancements at certain runway ends to accommodate aircraft overruns and rescue access in emergency situations.

- Safety improvements for Runways 22L, 4L/4R, and 27 are complete.
- In 2005, Massport constructed an Engineered Materials Arresting System (EMAS) bed at the end of Runway 22R in compliance with FAA directives, though no MEPA review was needed. In 2006, as part of a separate project, Massport installed an EMAS bed at the Runway 33L end.
- Consideration of further enhancements to the runway safety areas at the ends of Runways 22R and 33L is now a separate project for which Massport is beginning preparation of an Environmental Assessment (EA) in accordance with the National Environmental Policy Act (NEPA) and an Environmental Notification Form/Environmental Impact Report (ENF/EIR) in accordance with MEPA. The EA/EIR will examine a number of alternatives for enhancing the runway safety at these locations to be consistent with current FAA design guidelines to the extent practicable. This evaluation will likely lead to a different project, which will have its own Section 61 mitigation commitments that will be reported in subsequent EDRs.

Table 9-1 summarizes the mitigation measures in the Section 61 Findings for the Runway End Safety Improvements Project and Massport's progress in achieving these measures through the end of 2006.

Existing EMAS bed at the end of Runway 22R

Figure 9-1 Runway End Safety Improvements



Note: Aerial photo taken February, 2006. Runway 14-32 construction completed in November, 2006.

* Planning concepts undergoing evaluation and/or feasibility analysis.

Table 9-1 Runway End Safety Improvements Project Status Report (EOEA # 5122) Section 61 Mitigation Measures (as of December 31, 2006)

Mitigation Measure	Status
Logan Salt Marsh Replication Project	
5.2.3 Massport agreed to create 25,650 square feet of replacement wetlands along Taxiway November ("N") in the City of Boston.	**Completed.** The new 56,250 square-foot marsh is located next to Taxiway N. Vegetation established quickly with the help of "donor" stock that was taken from the original salt marsh; several species of fish, egrets, and snowy owls have been observed; and soft-shell clams and other shellfish have established throughout the new marsh.
5.2.5 Massport will assign a wetland specialist to monitor the salt marsh creation and report the findings.	**Completed.** A wetlands specialist was assigned to the Project. The replication area has developed into a healthy marsh environment, which is indistinguishable from the native marsh.
Monitoring activity will continue during the first two growing seasons to assess the progress of Spartina alterniflora and Spartina patens growth.	**Completed.** Permits were obtained that required Massport to monitor the health of vegetation, plant, fish, and wildlife for five years. The five-year monitoring program was completed in 1998 and the final Salt Marsh Monitoring Report was filed in February 1999. The Logan Salt Marsh Replication Project is providing more than six times as much salt marsh as was lost to the Runway End Safety Improvements Project.

Table 9-1 Runway End Safety Improvements Project Status Report
Section 61 Mitigation Measures (as of December 31, 2006) (Continued)

Mitigation Measure	Status
Lewis Lake Salt Marsh Restoration Monitoring Program	
Massport agreed to provide technical planning and assistance to the Town of Winthrop in the form of a study of the feasibility of restoring salt marsh vegetation at Lewis Lake. *5.2.6 The study was submitted to the conservation commission in 1992.*	**Completed.** The Lewis Lake Hydrologic Study was submitted to EOEA and noticed in the Environmental Monitor on June 8, 1993.
Potential Construction Impacts and Mitigation	
Construction mitigation measures include awarding the project to a single primary contractor; conducting all construction within the silt curtains; conducting a water quality monitoring program; implementing noise control guidelines for airfield construction; coordinating with the FAA to minimize impacts on air traffic operations and runway assignments; construction traffic restrictions and routing.	**Completed for Runways 22L, 27, 4L/4R.** Enhancements to the runway safety area for Runway 33L will be part of a new project which will also evaluate potential enhancements to the runway safety area of Runway 22R.
Soft-Shell Clam Planting and Monitoring Program	
Soft-shell clam monitoring.[1]	**Ongoing.** Massport completed the initial clam relocation and two subsequent annual planting programs. However, due to new FAA guidance regarding the proximity of wildlife attractants to runways Massport has not conducted any more planting programs. During 2005/2006, Massport continued meeting with the Division of Marine Fisheries (DMF) regarding alternative mitigation strategies. In June, 2007, Massport executed an Agreement with DMF relative to the Shellfish Relocation Plan. Under the Agreement, Massport will fund a series of alternative mitigation measures to be implemented by DMF, which include, but are not limited to: (1) improvements to the DMF soft-shell clam depuration facility in Newburyport, MA; (2) conversion of the DMF lobster hatchery on Martha's Vineyard to a soft-shell clam seed production facility; (3) a Boston Harbor water quality monitoring program; or (4) an extension of the DMF Boston Harbor Soft Shell Clam stock enhancement program. The Massachusetts Department of Environmental Protection (MDEP) has confirmed that payment by Massport to DMF shall fully satisfy Massport's obligation under Special Condition No. 23 of the MDEP Variance. Massport made an initial payment in June 2007 and expects to complete the funding program no later than June 30, 2009. Copies of the Agreement and the MDEP confirmation are included in *Appendix K, Logan RSA Shellfish Agreement*
Monitoring Program of Runway Ends Transition Zones	
Monitor the stability of the transition zones at the end of Runways 22L and 27.	**Ongoing.** Massport continues to conduct regular inspections to ensure that aggregate stone from the transition zones does not impact wetland and coastal areas, and to re-grade to repair damages as necessary. Several areas of geotextile mattresses which are used to stabilize the seaward perimeter of the aggregate stone have recently begun to exhibit signs of wear. Massport is currently evaluating strategies to repair these mattresses.

Note: Text in italics detailing the mitigation measures is from the Section 61 Findings submitted to the EOEA, August 1992.
1 Mitigation measure was established when obtaining the Wetlands Protection Act variance from the MDEP and not in the Section 61 Findings.

Projects with Ongoing Mitigation

West Garage Project - EOEA #9790

Permitting History

- Certificate on the Final EIR issued on March 16, 1995
- Section 61 Findings approved on March 27, 1995

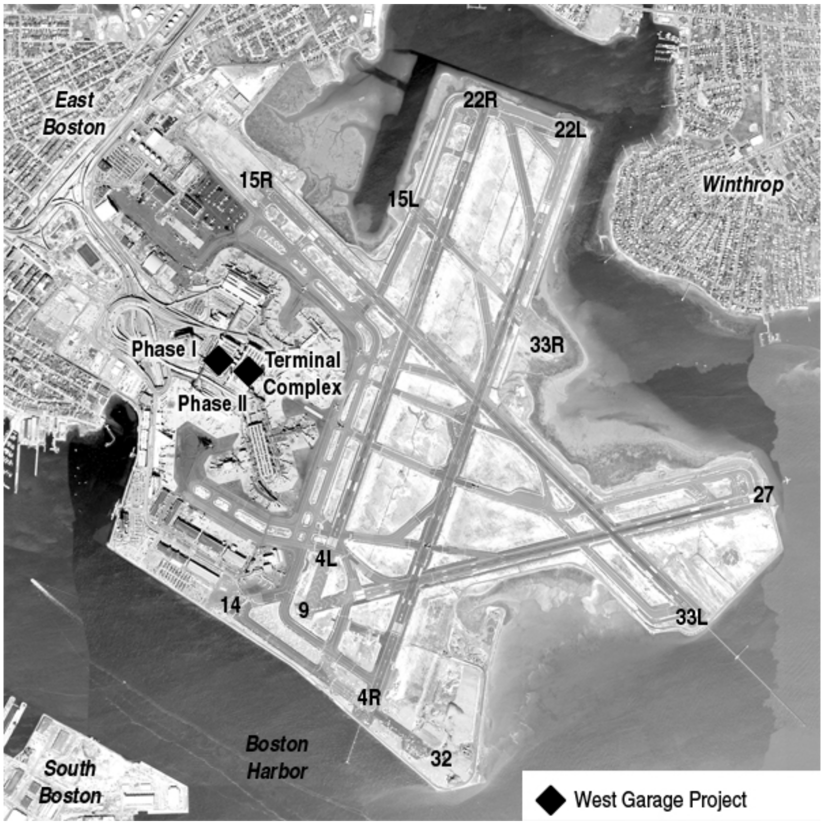
Project Status

The West Garage Project (Figure 9-2) was initially proposed to be constructed in two phases. Phase I of the Project provided 3,150 parking spaces that were consolidated from other areas of Logan Airport. The West Garage is directly connected to the Central Garage, centralizing the two structures' parking into a larger, single-functioning, easily accessible garage. The West Garage Project also included construction of elevated walkways connecting the West Garage to Terminals A and E, and improvements to the terminal roadways. The original design of Phase II of the West Garage included the construction of a new structured parking facility adjacent to the West Garage. Instead, Massport concluded it was more cost efficient to proceed with Phase II by adding three additional levels (Levels 5, 6, and 7) to the existing Central Garage. Phase II of the West Garage Project provides approximately 2,800 additional spaces.

- Phase I – Construction commenced in October 1995 and the garage opened on September 8, 1998. The elevated walkways to the terminals were completed in 2002. Improvements to terminal roadways were completed in 2003.
- Phase II – Permitting completed in 2000 to add three levels to the Central Garage. Construction commenced in 2004 and while portions of the new garage space were in use in 2006, the entire facility was completed in 2007.

Table 9-2 lists each Section 61 mitigation commitment for the West Garage Project and Massport's progress in achieving these measures. Table 9-3 details the elements and status of the Alternative Fuels Program, which was a key mitigation effort associated with the West Garage Project. The mitigation measures in Tables 9-2 and 9-3 are from Section IV Mitigation of the *West Garage Project Final EIR*, January 31, 1995, and those measures referenced in the Massport Board vote on the West Garage Project.

Figure 9-2 West Garage Project



Note:	Aerial photo taken February, 2006. Runway 14-32 construction completed in November, 2006.
Phase I	West Garage Construction
Phase II	Addition to Central Garage

Table 9-2 West Garage Project Status Report (EOEA #9790)
Details of Ongoing Section 61 Mitigation Measures (as of December 31, 2006)

Mitigation Measure	Status
Project Design Measures	
Vehicle Circulation and Operation	
Separate airport roadway into enplaning and deplaning levels.	**Completed.** The dual level roadway was completed in 2003 with connections to new Terminal E. The remainder on the service roadway systems opened in August 2004. When Terminal A was rebuilt it included separate enplaning and deplaning levels.
Improve access between the Airport Service Road and Route 1A.	**Ongoing.** Construction began in 2000. In January 2003, the new westbound bridge from Route 1A was opened to bi-directional traffic. This occurred in conjunction with the opening of the Ted Williams Tunnel to all traffic. Work will be complete in 2007.
Combine operations and vehicle connections between the West and Central Garages.	**Completed.** Construction of shared entrance and exit plazas was completed in September 1998.
Pick-up / drop-off areas within the garage at circulation cores.	**Completed.** Construction was completed in September 1998.
Improved vehicle flow within the Central Garage.	**Completed.** Construction of new high-speed ramps was completed in September 1998.
Provide reliable information about the location and availability of on-Airport parking spaces to eliminate vehicle re-circulation.	**Ongoing.** Massport currently provides information on peak period airport parking availability through its advertising and public informative programs; and has also implemented, in conjunction with "Smart Traveler", a tele-link between Massport's 1-800-23LOGAN and the "Smart Traveler" information system which provides up-to-date parking availability reports. Since August 1999, Web site users may log on to www.Massport.com and receive timely parking and traffic information. Massport procured a replacement parking revenue control system that provides an enhanced space count system and directional signage for the West Garage, Central Parking and the Terminal B Lot. The new revenue control system was fully operational in 2005.
Improve Terminal A curb to promote HOV use.	**Completed.** High occupancy vehicle (HOV) curb access at Terminal A was included in Delta Air Line's design for the Terminal A Replacement Project. The HOV curbs are closest to the terminal and provide ease of access to both the arrival and departure levels. There is no short-term parking at the terminal. The Central Parking Garage is connected to the new Terminal A by an elevated walkway system. Terminal A opened on March 16, 2005.
Pedestrian Circulation and Amenities	
Enhance pedestrian connections between Central and West Garages and terminals.	**Completed.** Climate-controlled pedestrian bridges with moving and stationary sidewalks were constructed to connect the West Garage to Terminal A and E. These pedestrian amenities opened at the same time as Phase I of the West Garage in 1998. Terminals B and C pedestrian connections began construction in the summer of 1999 and were completed in 2002. An additional connection was added between the Hilton Hotel and the West Garage.
Provide airport-wide baggage cart access.	**Completed.** Baggage carts and access for pedestrians became fully available in the completed West Garage via the elevated walkways to Terminals A and E. Baggage carts are available throughout the Airport, in the terminals and in the parking garages.

Table 9-2 West Garage Project Status Report (EOEA #9790)
Details of Ongoing Section 61 Mitigation Measures (as of December 31, 2006) (Continued)

Mitigation Measure	Status
Building Design Features	
Incorporate shield rooftop lighting with directional shielding to minimize glare. Install shield heating, ventilation, and air conditioning (HVAC) equipment to minimize noise.	**Completed.** Construction was completed in September 1998.
Massport will continue to meet with the Community Working Group (CWG) to review the building's design and to explore other design improvements that might address specific issues identified by the CWG such as the two aforementioned measures.	**Completed.** Massport staff held community meetings/CWG workshops during the design of the West Garage Project (during 1995 and 1996).
Construction Period Mitigation	
Agency and Community Coordination	
Designation of personnel to provide rapid response to construction issues and problems. Designate a liaison person to respond to any community concerns.	**Completed.** The Logan Modernization (formerly Logan 2000) Construction "Response-line" was created and placed in service in late February 1996. Since its implementation, no calls were received. Construction-related issues are handled through the Office of Government & Community Affairs (OGCA) community response liaison. OGCA has designated liaisons to respond to community concerns.
Prepare newsletters and hold community meetings during the construction process.	**Completed.** The West Garage *Highlights* newsletters were produced to coincide with all Draft EIR and Final EIR filings for Logan Modernizations projects. Massport announced all public comment periods in local papers. Community Forum meetings were noticed in community newspapers. Numerous community meetings were held for the general public and the CWG. In early 2001, a construction update feature was added to the Massport website. This section is updated periodically to inform interested parties about upcoming construction impacts associated with Phase II. The website allows users to add their addresses to a subscriber list. The subscribers on the list were notified when there were significant updates to the construction section.
Continue to coordinate construction activities with other governmental agencies as appropriate.	**Ongoing.** During construction, Massport staff held biweekly construction meetings with the contractor, CA/T, and Massport Operations. Massport has staff dedicated to daily interagency coordination, with the assistance of consultant personnel. There are meetings with the CA/T staff on an as-needed basis with regard to the 7D2 and the 8A construction process. Establishment of the Massachusetts Bay Transportation Authority's (MBTA's) new Blue Line Airport Station was an element of the 8A construction. The MBTA opened the new station in June 2004. Massport and MBTA continue to collaborate on Silver Line Airport service.
Placement of personnel and equipment to monitor and report on the status of construction.	**Completed.** Massport hired full-time construction management staff during Phase I who maintained daily reports and logs for all construction activities including any potential impacts or mitigation measures. Reports and logs were maintained for traffic, parking, noise, soil disposal, etc. Monitoring continued through Phase II.

Table 9-2 West Garage Project Status Report (EOEA #9790)
Details of Ongoing Section 61 Mitigation Measures (as of December 31, 2006) (Continued)

Mitigation Measure	Status
Creation of specific construction-related performance standards for incorporation into construction contracts, such as: ▪ *Safety and security measures;* ▪ *Site appearance and housekeeping requirements; and* ▪ *Site logistics and traffic control measures.*	**Completed.** The West Garage contract specifications included standards and requirements for safety and security, site appearance, and site logistics and traffic control. These standards and requirements were adhered to during construction of Phase I of the West Garage Project and Phase II Central Garage expansion.
Ground Transportation Mitigation During Construction	
Construction vehicles will be required to use either state highways (Route 1A, I-90, and the main airport roadway) or Logan Airport roadways for access to and from the construction site, unless accessing local businesses. Truck routes designed to minimize impacts to the regional highway network and neighborhoods will be specified in contractors' construction specifications.	**Completed.** The West Garage Project's construction specifications require the use of designated truck routes. During construction of Phase I, truck routes were restricted to Airport service roads and roads accessed from either the Ted Williams Tunnel and/or Route 1A. East Boston streets were not utilized. These mitigation measures also were followed as part of the Phase II Central Garage expansion.
Concrete production and batching will occur in existing plants with access via Route 1A or I-90 in order to reduce on-Airport construction activities and consolidate truck trips to greatest extent possible.	**Completed.** On-site concrete production and batching were prohibited during Phase I of the West Garage Project. Contractors used concrete suppliers that accessed the site via Route 1A from the north. Concrete production and batching was conducted off-site and product delivery was consolidated in as few truck trips as possible. These mitigation measures also were followed as part of the ongoing Phase II Central Garage expansion.
Construction companies will be required to provide off-Airport parking for their employees. No construction employees will be allowed to park at the construction site or anywhere at the Airport, except for a small number of supervisory personnel.	**Completed.** During Phase I of the West Garage Project, on-site parking was limited to 30 spaces for supervisory personnel and equipment only. Parking permits were issued to enforce these rules. The State Police towed vehicles parked without permits. These mitigation measures also were followed as part of the Phase II Central Garage expansion.
Construction workers were expected to access the site via public transportation or via shuttle buses from off-Airport parking areas. Massport will encourage construction workers to use Logan Express, Water Shuttle, MBTA, and other modes of public transportation.	**Completed.** Massport provided construction contractors with information about public transportation alternatives for their workers and also allowed construction workers to purchase discounted monthly passes for Logan Express to encourage use of these services. Massport also encouraged construction contractors to join the Logan Airport Employee Transportation Management Association (Logan TMA), which is open to all airport employers. During the construction period of Phase I of the West Garage Project, construction workers were encouraged to use public transportation and the aforementioned Massport services to access the job site. These mitigation measures also were followed as part of the Phase II Central Garage expansion.
Massport will explore the feasibility of consolidated off-Airport parking for construction workers.	**Completed.** Massport reviewed the costs and feasibility of providing consolidated off-Airport parking. Because workers commuted to the Airport from many different destinations, using many modes of transportation, this option did not appear cost-effective or practical until the number of contractor employees exceeded 500-600. During Phase I, Massport monitored the schedules, but the number of contractor employees (approximately 250) did not exceed the quantity needed to provide a consolidated off-site parking area.

Table 9-2 West Garage Project Status Report (EOEA #9790)
Details of Ongoing Section 61 Mitigation Measures (as of December 31, 2006)
(Continued)

Mitigation Measure	Status
Massport will encourage the provision of consolidated shuttle bus service and will encourage the use of alternative fuel vehicles.	**Completed.** Massport reviewed the costs and feasibility of providing a consolidated off-Airport shuttle bus for contractor employees. During Phase I, Massport monitored the schedules to determine if employees exceeded 500 to 600, but the number of contractor employees (approximately 250) did not exceed the quantity required for Massport to provide an off-Airport shuttle bus service.
Massport will construct temporary roadways as necessary to maintain operation of all Airport roadway connections and minimize impacts to on-Airport traffic patterns.	**Completed.** Contract plans and specifications required maintenance of the existing number of traffic lanes throughout construction of Phase I. Temporary lane closures were conducted during off-peak hours (midnight to 5:00 AM). Any other extended closures required the construction of a temporary detour. These mitigation measures also were followed as part of the Phase II Central Garage expansion.
Massport will develop specific construction staging plans, including acceleration and deceleration lanes for trucks and maintaining the existing number of travel lanes.	**Completed.** During construction of Phase I of the West Garage Project, truck access was provided via a separate lane off the Airport U-turn to minimize disruption to inbound and outbound Airport traffic. The existing travel lanes were maintained at all times. These mitigation measures also were followed as part of the Phase II Central Garage expansion.
Construction Management	
Control noise by: ■ *Pre-auguring pile locations and the use of pre-cast concrete piles in lieu of steel piles.* ■ *Using noise control techniques to reduce noise from pile driving by at least 5 A-weighted decibels (dBA) below their unmitigated levels.*	**Completed.** All piles used in Phase I were pre-cast concrete with pre-auguring. No steel piles were used. Concrete piles were drilled for largest portion of their depth to minimize noise impacts. No piles were driven after 4:00 PM. During construction, further noise evaluation was not required for the West Garage since noise levels did not exceed applicable regulations. All specifications and performance standards were incorporated into the construction contract.
Control noise by: ■ *Evaluating further noise control options during project design.* ■ *Incorporating appropriate operational specifications and performance standards into the construction contract documents.* ■ *Monitor community noise levels during construction to verify compliance with contract specifications and applicable state and local noise regulations.*	**Completed.** These mitigation measures also were followed as part of the Phase II Central Garage Expansion.
Hours of work generally will be limited to typical working hours of 7:00 AM to 5:00 PM unless constrained by operational conditions at the Airport.	**Completed.** Work involving roadway lane closures was conducted after 5:00 PM or before 7:00 AM during Phase I. These mitigation measures also were followed as part of the Phase II Central Garage expansion.
Adequate storage areas for construction materials will be located away from residential areas.	**Completed.** During construction of Phase I, all storage of materials occurred on the construction site very far from the residential areas. Due to limited available space, very little construction materials were stored on-Airport during Phase II. Following community coordination, a section of the North Service Area was used for temporary staging.

**Table 9-2 West Garage Project Status Report (EOEA #9790)
Details of Ongoing Section 61 Mitigation Measures (as of December 31, 2006)
(Continued)**

Mitigation Measure	Status
Fugitive dust will be controlled through wetting, sweeping, and other dust suppression techniques. Massport will require contractors to maintain on-site water trucks. All trucks hauling materials and excavation from the site will be covered.	**Completed.** During construction of Phase I, a water truck was maintained on-site at all times and road sweeping occurred as required to clean any debris dropped on road or tracked by tires. These mitigation measures were followed as part of the Phase II Central Garage expansion.
Massport will mitigate construction-related air quality impacts through the on-Airport traffic flow maintenance procedures and the use of good housekeeping practices to minimize fugitive dust.	**Completed.** During construction of Phase I, the contractor maintained on-site wheel washes, water trucks, and road sweepers to control fugitive dust. These mitigation measures were followed as part of the Phase II Central Garage expansion.
Develop a Draft Soil Management Plan.	**Completed.** The Soil Management Plan, a component of the Logan Modernization Environmental Plan, was enforced during construction. The soil excavation activities associated with the West Garage Foundation project were completed. No remediation waste was identified; all non-remediation waste excavated (total Petroleum Hydrocarbons were less than 500 mg/kg) was shipped off-site to approved off-site disposal facilities under a MDEP Material Shipping Record. Massport conducted oversight of the contractor's compliance with the Soil Management Plan. No soil excavation was required as part of Phase II.
Develop a Draft Dewatering Management Plan which addresses requirements for testing, handling, and treatment of contaminated groundwater from de-watering prior to discharge.	**Completed.** A final Dewatering Management Plan was incorporated into the Logan Modernization Environmental Plan. During the West Garage Foundation project, all de-watering was performed in compliance with Logan Modernization, Massachusetts Contingency Plan (MCP) requirements and Massport's National Pollutant Discharge Elimination System (NPDES) permit. Massport's oversight of the contractor's compliance with the De-watering Plan continued during the West Garage superstructure construction project. No construction dewatering was required as part of Phase II.
Develop a Draft Stormwater Pollution Prevention Plan which is intended to keep the Airport's storm water system free of sediment and contaminants during construction. The plan will be incorporated into construction plans, specifications, and contracts.	**Completed.** A final Stormwater Pollution Prevention Plan (SWPPP) was incorporated into the Logan Modernization Environmental Plan. During the West Garage foundation project, the contractor complied with the requirements specified in the SWPPP. Massport's oversight of the contractor's compliance with the SWPPP continued during the West Garage superstructure construction project. No violations were reported. These mitigation measures also were followed as part of the Phase II Central Garage expansion.
Develop a Draft Health and Safety Plan which provides the minimum health and safety specifications that contractors must meet during construction, including requirements for environmental monitoring, personnel protective equipment, site control and security, and training.	**Completed.** A final Health and Safety Plan (HASP) was incorporated into the Logan Modernization Environmental Plan. During the West Garage foundation project, the contractor performed its activities in compliance with the HASP. Massport's oversight of the contractor's compliance with the HASP continued during the West Garage superstructure construction project. The contractor submitted a specific safety and security plan for review and approval by the construction manager. The Terminal Area Coordinator maintained regular (at least weekly) site audits to verify compliance. These mitigation measures also were followed as part of the Phase II Central Garage expansion.
Rodent control inspection, monitoring, and treatment will be carried out before, during, and at the completion of all foundation and utilities demolition and construction work.	**Completed.** Rodent control was not an issue during construction of Phase I of the West Garage Project, nor during Phase II.

**Table 9-2 West Garage Project Status Report (EOEA #9790)
Details of Ongoing Section 61 Mitigation Measures (as of December 31, 2006)
(Continued)**

Mitigation Measure	Status
Massport has asked the contractor to review other construction mitigation measures including disposal of excavated materials, fences, and wheel washing.	**Completed.** During construction of Phase I of the West Garage Project, Massport installed and maintained graphic panels on all construction fences to provide a more pleasing appearance to the construction site. Wheel washing was required at all times. Disposal of excavated materials was compliant with the Soil Management Plan. These mitigation measures also were followed as part of the Phase II Central Garage expansion.
Parking Pricing	
Parking pricing initiatives: keeping first-hour price high enough to provide a disincentive for pick-up/ drop-off.	**Ongoing.** Massport continued to evaluate and adjust the first-hour price of parking. In light of the security prohibition on curbside parking, in 2002, Massport reduced the cost of the first half-hour from $4 to $2, the first time it has changed since the first-hour free rate was rescinded in 1998. In June, 2007, rates increased to $3 for the first half-hour.
Parking pricing initiatives: keeping the weekly price low enough to encourage vacation travelers to park for a week.	**Ongoing.** Massport encourages long-term parking by providing cheaper parking at its Satellite Economy Lots. Data on long-term parking use are provided in *Chapter 5, Ground Transportation.*
Massport will consider means to encourage the use of limited amount of on-Airport commercial parking for long-term parking and promote environmentally positive modes of airport access by air passengers.	**Ongoing.** An important element of Massport's strategy to reduce the impact of Airport-related traffic on regional highways and local streets in neighboring communities is the Massport Parking Pricing Policy. Historically, Massport's Parking Pricing Policy encouraged long-term parking over short-term parking. That was accomplished by charging a premium for time spent in the on-Airport parking facilities between one and four hours and substantially reducing the per hour rate for parking durations longer than four hours. This strategy has proved to be a successful incentive for passengers to drive themselves and park long-term at Logan Airport rather than having someone else drop them off or pick them up.
Once sufficient data has been collected, Massport will evaluate parking behavior that may be attributable to the modified rates and consider further adjustments in pricing that will assist in achieving Massport's ground transportation goals.	**Ongoing.** Massport's current parking rate structure has been compatible with continued growth in long-term parking and declines in pick-up/drop-off mode shares, and the continued increases in total HOV use by air passengers toward the stated Massport goal of 35.2 percent HOV access mode share. Adjustments to hourly parking rates have been made to reflect usage patterns.
Executive Director shall report to Massport annually regarding the effectiveness of parking pricing policy in achieving Massport's ground access goals initiatives and recommend appropriate policy adjustments.	**Ongoing.** In October 2001, Massport Board granted approval of commercial parking rates consistent with Massport's ground access goals. The higher rates went into effect November 12, 2001. In addition, in light of the new security restrictions on curbside parking, Massport reduced the cost of parking for the first half-hour from $4 to $2. In June, 2007, the cost of parking for the first half-hour increased to $3. These modifications should foster the use of alternate forms of transportation for getting to Logan Airport, whereas the weekly cap at Economy parking encourages long-term parking over pick-up and drop-off as a mode of access.

Table 9-2 West Garage Project Status Report (EOEA #9790)
Details of Ongoing Section 61 Mitigation Measures (as of December 31, 2006) (Continued)

Mitigation Measure	Status
Concurrent Ground Access Improvement Mitigation Measures	
Employee Trip Reduction Measures	
Massport will form a Transportation Management Association (TMA) for Logan Airport employees to provide new opportunities for the development of targeted transportation demand management (TDM) strategies for Massport and airport tenant employees. *Massport will provide support for the formation and operation of the Logan Airport TMA.*	**Ongoing.** In the 1995 Board Resolution, Massport's Executive Director was authorized to expend an initial amount of up to $50,000 for the purpose of organizing the Logan TMA. The Logan TMA was created in March 1997. Massport continues to support the Logan TMA by providing the Logan TMA with $65,000 annually, as well as space and equipment for the Logan TMA store in Terminal C. In turn, the Logan TMA has a full time Logan TMA Coordinator who develops, coordinates, and implements effective TDM strategies including discounts on HOV services. The Logan TMA and Massport's support of the Logan TMA continues. Refer to Chapter 5, Ground Transportation for additional details. MassRIDES, a free service of the Executive Office of Transportation (EOT), provides resources for commuters, employers, students, and other travel markets traveling in and around the Commonwealth. In late 2006 Logan TMA staff requested a meeting with all major employers at Logan Airport to explain existing TMA programs, and to explore commuting issues that the TMA might be able to help address. TMA staff arranged a series of one-on-one meetings with those employers who responded positively; the TMA staff then conducted the meetings. Based largely from the information gathered at those meetings a series of new commuting initiatives was launched by the TMA in 2007.
Massport will seek to develop, coordinate, and implement effective TDM strategies to reduce the number of single-occupant trips made by all Logan Airport employees.	**Ongoing.** The 1995 Board Resolution authorized Massport to actively explore with the Logan TMA the feasibility of implementing various services. Massport assists the Logan TMA in providing services and by conducting the Logan Airport Employee Survey, intermittently to collect data useful to the TMA.
Massport will encourage participation by all employees, but will particularly target the airport's largest employers.	**Ongoing.** Massport continues to target Logan Airport's largest employers. Refer to *Chapter 5, Ground Transportation*, for more details on the Logan TMA and its membership.
Massport will report on the formation and activities of the TMA in the next Generic Environmental Impact Report (GEIR).	**Ongoing.** The Environmental Status and Planning Reports (ESPRs) and EDRs provide detailed information on the Logan TMA, its services, membership, and employee commuter choices (via the Logan Airport Employee Survey). Logan TMA information is provided in *Chapter 5, Ground Transportation* of this *2006 EDR*.
Massport proposes to implement a new Logan Express service or other HOV service depending on the needs of the targeted market before Phase II of the West Garage Project is operational.	**Completed.** Massport completed its market-based analysis for a North Shore Logan Express in March 2000. The Peabody Logan Express facility opened in September 2001.

**Table 9-2 West Garage Project Status Report (EOEA #9790)
Details of Ongoing Section 61 Mitigation Measures (as of December 31, 2006)
(Continued)**

Mitigation Measure	Status
Provide an airport shuttle service from South Station Transportation Center. Massport is preparing a feasibility and business plan for a South Station-Logan Airport shuttle service and will implement this service when the Third Harbor Tunnel is opened for commercial traffic. This service will be modeled on the existing, successful Logan Express services and will include frequent bus service between South Station and the airport terminals. *Massport will regularly evaluate the frequency of, and demand for, such shuttle service and will provide such service at the greatest frequency that is practical and effective.*	**Completed.** In 1997, Massport sponsored the development of a joint public/private partnership with intercity bus operators serving the South Station Transportation Center. This partnership resulted in a bus connection that both the carriers and Massport promote. The service had limited success largely because of variable operator schedules and the fact that the service operates out of the South Station Transportation Center instead of a location closer to the South Station Red Line stop. To improve the service between South Station and Logan Airport, Massport initiated a service, Logan DART, in November 2000. Massport anticipated that this service would provide an interim connection between South Station and Logan Airport until the opening of the South Boston Piers Transitway. This service competed with other frequent commercial bus services between South Station and Logan Airport, including Concord Trailways, Dartmouth Coach, Plymouth & Brockton, Bonanza, Vermont Transit, and C&J Trailways. Together, these services provided more than 50 daily weekday departures from South Station from 4:45 AM to 11:45 PM. Due to the poor ridership on DART, the numerous options available from South Station, the financial impacts following September 11, 2001 and the scheduled opening of the Silver Line Extension/AITC, Massport suspended this service in November 2001. In the interim, Massport coordinated a database of existing South Station/Logan Airport services provided by scheduled carriers and has produced flyers to improve visibility of this service to the public. This service accommodated passenger demand between South Station and Logan Airport until Silver Line service to Logan Airport commenced in June, 2005 (refer to *Chapter 5, Ground Transportation* for additional information). The Silver Line Airport service now provides this direct link.
Massport will implement a new water shuttle service in Boston Harbor before the opening of Phase I of the West Garage Project. The water shuttle would run between Logan Airport and one, or possibly, more sites in the Harbor.	**Completed.** Massport identified a number of possible destinations for a new water shuttle service, with the Quincy Shipyard and Long Wharf sites meeting the basic service parameters. Harbor Express was chosen as the water shuttle operator and began operation between the Airport and these two sites in November 1996. Massport continues to support the Rowes Wharf Water Taxi and City Water Taxi operations. Refer to *Chapter 5, Ground Transportation* for water shuttle ridership information.
The Executive Director shall make recommendations to Massport for budgetary appropriations to establish and implement the new ground access services on a schedule that permits Massport to implement the new ground access services within these time frames.	**Ongoing.** The Executive Director recommends budgetary appropriations for ground access services on an annual basis.

**Table 9-2 West Garage Project Status Report (EOEA #9790)
Details of Ongoing Section 61 Mitigation Measures (as of December 31, 2006)
(Continued)**

Mitigation Measure	Status
Enhancement of Existing HOV Services	
Expand Logan Express hours of service.	**Completed.** During 2000, Massport expanded service for existing Logan Express including a 4:00 AM early bird Braintree bus. All buses have higher passenger capacity (45 foot coaches). Headway remains every 30 minutes and cover buses are added to avoid deferred boardings during peak travel periods. Additional service is provided to peak travel times. Refer to *Chapter 5, Ground Transportation*.
Provide a guaranteed ride home for Logan Express users.	**On-hold.** From January 1995 until November 2001, Massport provided this service for air passengers and Logan TMA members. Due to financial constraints following September 11, 2001 this program was suspended for those passengers arriving after midnight with pre-purchased round-trip Logan Express tickets. Logan TMA members still benefit from this service.
Provide Logan Express price incentives.	**Ongoing.** Massport continues to monitor price incentives and evaluates additional incentives to promote Logan Express ridership. Massport spent more than $188,000 on marketing of Logan Express in 2006, of which roughly one half was allocated towards boosting the Peabody service ridership.
Develop an additional Logan Express service.	**Completed.** Massport opened a fourth Logan Express in Peabody, Massachusetts in September 2001, years before the Section 61 Commitment date of the opening of Phase II of the West Garage Project. While the new service was initially planned to operate on a half-hour schedule like the Braintree, Framingham, and Woburn services, because of the dramatic air passenger reductions after September 11, 2001 (during Peabody's first week of service), to cut costs, Massport operated the Peabody Logan Express on hourly headways. In January 2004, in light of low levels of ridership on the Peabody Logan Express, Massport doubled service by going to a half-hourly schedule in an effort to stimulate ridership growth at Peabody. However, in 2004, annual ridership levels at Peabody continued to be low, approaching 77,000 as compared to 527,000 at Braintree, 379,000 at Framingham, and 283,000 at Woburn. The trend of low ridership at Peabody continued in 2006. Annual ridership levels at Peabody, Braintree, Framingham, and Woburn were approximately 75,000, 537,000, 410,000, and 289,000, respectively. Given the low levels of ridership on the Logan Express in Peabody, Massport continues to evaluate modifying or closing this service and redeploying its financial resources on more productive and cost-effective HOV services. In the interim, rather than closing this location, service was reduced to hourly in April 2006. The *2007 EDR* will update the status of this service.
In conjunction with the MBTA, Massport will pursue joint ticketing opportunities for the Hingham Commuter Boat and the Logan Airport Water Shuttle.	**Completed.** As reported in the *1999 ESPR* and the *2000 EDR*, this ticketing program was explored, implemented in mid-1995 and discontinued in 2000 since many of the former users of this program now use the Harbor Express Service direct from Quincy to Logan Airport.
Massport is reviewing the fee schedules and operating requirements of the dock in order to make it more accessible and convenient to potential water taxi operators.	**Completed.** In the fall of 1995, Massport made physical improvements to a low-freeboard float at the Logan Dock to create a dock capable of accommodating smaller vessels such as water taxis. In the fall of 2002, Massport completed expansion of the Harbor side dock to accommodate the demand of additional vessels and to comply with handicapped accessibility requirements. The improved dock increases capacity from a two float system to a seven float system to accommodate the various water shuttles, taxis, and charter boats that are licensed to use it.

**Table 9-2 West Garage Project Status Report (EOEA #9790)
Details of Ongoing Section 61 Mitigation Measures (as of December 31, 2006) (Continued)**

Mitigation Measure	Status
Expand docking capacity at Logan Airport for water taxi and other services.	**Completed.** Massport accommodated water taxi services, enhanced the dock as described above, provided communication links for passengers to call the taxi, and allowed taxi passengers to use the free water shuttle buses to access the terminals from the dock. Water taxi information was posted on the Massport web site. Details on the Water Taxi are provided in *Chapter 5, Ground Transportation*.
Initiate a new Boston Harbor Water shuttle service.	**Completed.** Harbor Express service, between Logan Airport and the South Shore, began in November 1996, well before the opening of Phase I of the West Garage in September 1998. In 2001, the MBTA took over operations of this service.
Other Measures	
Coordinate with public and private entities to provide more extensive radio, television, and telephone announcements of poor traffic conditions with suggestions for alternative access modes.	**Ongoing.** The 1-800-23LOGAN Ground Transportation Line includes a direct link to "Smart Traveler." Callers to both the Ground Transportation Line and to Smart Traveler may access the latest traffic information, parking information, or learn about alternative forms of transportation to and from Logan Airport. Starting in August 1999, real-time traffic information and parking became accessible on Massport's website. Massport regularly contacts the media to inform the public about roadway changes, parking shortages and to encourage travelers to use HOV services. Similar information is disseminated on the Logan Airport e-mail subscriber list and on the Massport website.
HOV Marketing and advertising. Massport will continue the advertising and marketing programs for HOV services with an emphasis on promoting MBTA, Logan Express and water shuttle services to and from the airport.	**Ongoing.** Massport continues to promote HOV services including availability; schedules and fares to consumers through the ground transportation Information Line at 1-800-23LOGAN and the website that provides up to the minute information. HOV advertising boards, schedules, and maps are placed at all Logan Airport terminals, at the MBTA Airport Station and at all shuttle bus pick-up/drop-off locations. A brochure for Logan Airport water shuttle service was completed and distributed to the terminals and travel professionals. Water transportation service to downtown Boston was advertised in the following ways: ■ In 2004, Massport prepared and distributed a brochure promoting passenger water transportation to and from Logan Airport. The brochure was centered around a new harbor wide map that also was included on new signs installed at the Logan Airport dock facility. These materials directed passengers to either the MBTA Harbor Express scheduled ferry or one of three on-call water taxi businesses serving the Airport. ■ Massport staff participated in the MBTA "Water Transportation Week" promotion kick-off event in 2005, which was held at Rowes Wharf. At Logan Airport, Massport updated signs on baggage carousels in the terminals and created new vendor signs which were mounted at the dock. In addition, Massport prepared briefing packages on the various water transportation services for its public information staff working in the terminals so that they could disseminate the most current and accurate information to the public. Similarly, Massport updated its website and 1-800-23-Logan services.

**Table 9-2 West Garage Project Status Report (EOEA #9790)
Details of Ongoing Section 61 Mitigation Measures (as of December 31, 2006) (Continued)**

Mitigation Measure	Status
Prepare an inventory of private scheduled services including origins/destinations, schedule, and cost.	**Ongoing.** Massport continued to update and track information and services by more than 700 privately operated passenger services certified to operate at Logan Airport. Industry changes with such operations make publication of reliable service and schedule information impractical, if not impossible. However, Massport continued to expand and update information on transportation options to Logan Airport using the latest information technologies, including: ■ Information and links to transportation companies on the Massport website. Some sites accessed through internet links provided passengers with on-line reservation services; ■ Most scheduled service operators provided placards with current schedules posted in bus stop shelters located on the curb at each terminal. Individual bus schedules were also available at the information booths; and ■ Transportation information database for on-line assistance at Logan Airport terminal information booths.
Proceed with environmental review and seek funding for construction of People Mover system.	**Completed.** Massport completed the EA and Major Investment Study for the Logan Airport Inter-modal Transit Connector (AITC). The AITC evolved out of the People Mover EIR/MIS process and evaluated new access routes to both the Blue Line and the South Station Transportation Center. On February 25, 1997, Massport submitted to the United States (U.S.) House Committee on Transportation and Infrastructure an application for the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA) funds for the next phase of environmental review, planning and design of the AITC. Congressman J. Joseph Moakley was the congressional sponsor; the project also has the support from the Secretary of Transportation and the U.S. Environmental Protection Agency (EPA). The Logan AITC was included, for an unspecified funding level, in the 1997 ISTEA reauthorization bill. In 1998, Massport received a certificate on a Notice of Project Change for the People Mover from the Secretary of Environmental Affairs and a Finding of No Significant Impact (FONSI) on an EA from the Federal Transit Authority. In June 2001, Massport and the MBTA executed an interagency agreement for the purchase of eight (8) Silver Line dual mode buses and the Massport Board approved the expenditure of approximately $13 million for this purchase. In 2004 Massport and the MBTA finalized the 10 year/$20 million dollar Inter-Agency Operating & Maintenance Agreement. The MBTA and Massport also tested the prototype bus on the Airport roadway system, checking vertical clearances, turning radii, and pick up/ drop off locations. Initial Silver Line service to the Airport began in December 2004 and full service began in June 2005 (refer to *Chapter 5, Ground Transportation* for additional details). In 2005, Massport and MBTA initiated planning to provide automated fare collection/Charlie Card equipment in each of the Logan Airport terminals. Charlie Card ticketing opened at Logan Airport in November 2006.
Alternative Fuels program. Massport is carrying out an extensive program to convert existing Massport-owned service vehicles to environmentally preferable sources. Table IV-2 summarizes the elements of the alternative fuels program and the schedule for their implementation.	**Ongoing.** Table 9-3 of this *2006 EDR* details Massport's progress in achieving these measures as described in *Chapter 7, Air Quality/Emissions Reduction.*

**Table 9-2 West Garage Project Status Report (EOEA #9790)
Details of Ongoing Section 61 Mitigation Measures (as of December 31, 2006) (Continued)**

Mitigation Measure	Status
Measuring, Monitoring, and Evaluating Ground Access Improvements	
Massport will assess progress towards the achievement of HOV goals using on-Airport Automated Traffic Monitoring Systems (ATMS).	**Ongoing.** ATMS is composed of three technologies that detect vehicle movement: inductive loop lines acoustic sensors, and canoga cards. Upgrades of the ATMS equipment, program software and infrastructure are underway and will result in accurate, meaningful vehicle counts. With the completion of the Terminal Area Roadway system and other regional highways expected in the near future, Massport prepared a long-range ATMS plan that will provide daily traffic counts at all gateways and other critical locations. Massport will be using new technologies in order to utilize on-Airport traffic signal controllers and loops for traffic counting. This project is now in the capital budget.
Massport will assess progress towards the achievement of HOV goals by monitoring parked vehicles using systems such as the parking and revenue control (PARC) system.	**Ongoing.** Massport monitors all parking activity at Logan Airport and inventories the following commercial parking facilities on a daily basis: the lots at Terminal B and C (Central/West Garage); Economy 1 and 2 and "Logan Park and Go" in Chelsea. Massport maintains a PARC system at the commercial parking lots located at Terminals B and C, Satellites 1 and 2, "Logan Park and Go" in Chelsea and at each of the remote Logan Express Parking facilities. Parking exit data is recorded at one-minute intervals at each location. Updated parking revenue control systems were installed in the Terminal B Garage in 2004, with Central/West Garage following in 2005.
Monitor HOV Services (Logan Express, MBTA, water shuttle, limousine/bus, and taxi).	**Ongoing.** Massport maintains a "real time" log of dispatcher reports for Logan Express, the taxi pool, and the bus/limousine pool and other ground transportation operations at Logan Airport. Massport coordinates with the MBTA and the operators of all water shuttles serving Logan Airport to track ridership and service schedules. Daily Logan Express ridership and operations data are submitted monthly to Massport. Massport maintains a Passenger Water Transportation Ridership Summary on a monthly basis. Massport maintains a continuing record, the Ground Transportation Unit (GTU) Daily Event Log, of all occurrences impacting the Airport roadways, terminal curbs, and access roads. This log cites such events as accidents, lane closures, bus delays, as well as routine and non-transportation events.
Monitor passenger activity and employee modes of transportation.	**Ongoing.** The most recent employee and air passenger surveys were conducted in the winter/spring of 2007 and will be reported in the *2007 EDR*.
Massport supports the use of Automated Vehicle Identification (AVI) to monitor, manage, and facilitate efficient traffic operations at Logan Airport and elsewhere on the regional transportation system.	**Ongoing.** An AVI system for Massport's Aviation Transportation Department has been designed. However, capital funding has been delayed due to the impacts of September 11, 2001.
Track the effectiveness of ground access measures.	**Ongoing.** Massport continues to track the effectiveness of its ground access mitigation programs in its annual MEPA filings.

Note: Text in italics detailing the mitigation measures is from Section IV Mitigation of the *West Garage Final EIR*, January 31, 1995.

Table 9-3 Alternative Fuels Program — Details of Ongoing Section 61 Mitigation Measures for the West Garage Project (as of December 31, 2006)

Program Element	Projected Date of Completion/ Acquisition	Status
Purchase four electric passenger utility vehicles	Winter 1995	**Completed.**
Purchase five electric sedans	Winter and Summer 1995	**Completed.**
Build compressed natural gas (CNG) quick-fill station	Spring 1995	**Completed.** The station has been operational since 1995. It is New England's largest CNG quick fill station and serves Massport's vehicles, over two dozen Airport tenants, and nearby fleet vehicles. New higher flow dispensers at the station have reduced fueling time for heavy-duty vehicles, and have increased storage capacity at the station. Currently, more than a dozen companies and organizations are fueling natural gas powered vehicles at the station. The station is currently pumping approximately 500,000 gallon equivalents per year. Additional above-ground storage was also provided. Massport anticipates the station to be relocated in conjunction with some redevelopment of the North Cargo Area.
Purchase five electric buses	Spring and Summer 1995	**Completed.** Massport purchased two electric buses and leased one. These vehicles operated at Logan Airport between 1996 and 2001. After more than six years of testing and evaluation, Massport determined that electric buses are neither durable nor dependable enough to function effectively in the demanding operating environment at Logan Airport.
Purchase five electric pick-up trucks	Spring 1995	**Completed.**
Use soy-blend diesel fuel	Spring 1995	**Completed.** Massport's shuttle fleet operated on soy diesel from 1995 to 1999. In 1999, all the buses were replaced with CNG buses, which are still in service.
Purchase additional alternative fuel vehicles	Spring 1995	**Completed.** Refer to *Chapter 7, Air Quality/ Emission Reduction* for a list of alternative fuel vehicles.
Purchase six CNG buses	Summer 1995	**Completed.** There are 32 CNG shuttle buses in the current fleet.
Purchase four electric vans	Summer 1995	**Completed.**
Install quick-charge kiosks for electric vehicles	Summer 1995	**Completed.** There are 15 inductive quick-charge stations.
Develop slow-charge infrastructure	Ongoing	**Completed.** Fourteen dedicated conductive charging locations were established at the Tower Parking Lot, Central Parking, Facilities, the Bus Maintenance Facility, and the Water Department. Six of these charging stations were removed when the Central Garage was expanded.

International Gateway Project (Terminal E) – EOEA #9791

Permitting History:

- Certificate on the Final EIR issued on December 2, 1996
- Section 61 Findings submitted to EOEA June 26, 1997

Project Status

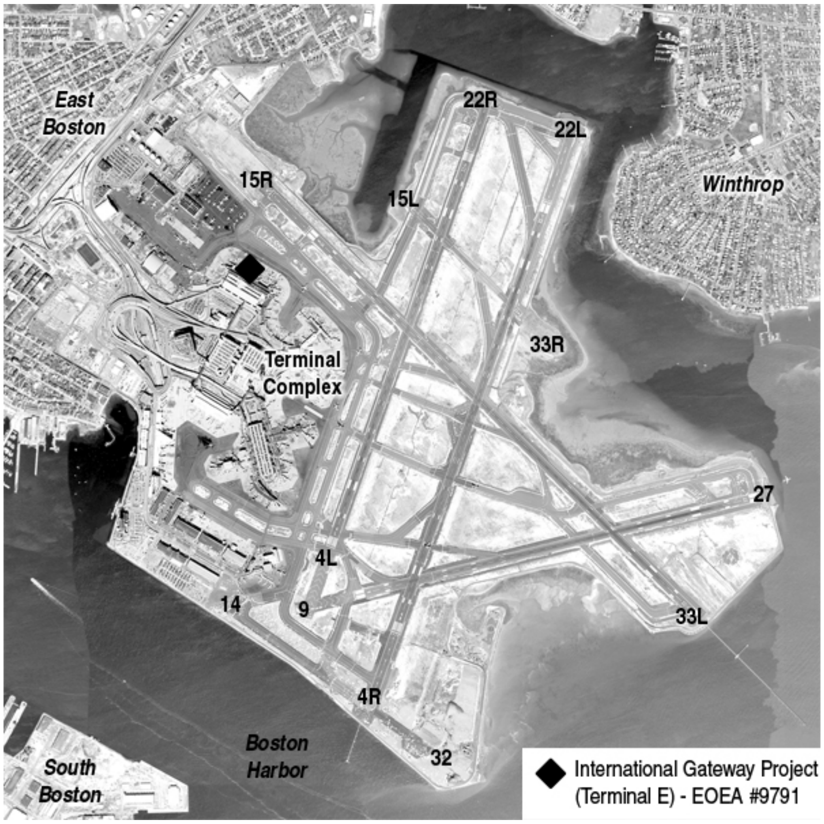
The International Gateway Project (Figure 9-3) expands and upgrades Terminal E to provide better service to international passengers. The original Terminal E was opened in 1974 and over time became outdated and too small to accommodate the growth in international travel. This project is being constructed in phases:

- **Phase 1 –** This phase of the project included a weather-protected outside airside bus portico with an elevator and escalator linking the ground floor with the second floor to accommodate passengers arriving on remotely parked aircraft that are unable to park at a gate because it is occupied by another aircraft.
- **Phase 2 –** This phase of the project enlarged Logan Airport's congested FIS Facility, and improved the meeter/greeter lobby and the ticketing area of Terminal E to maximize passenger convenience and reduce processing times in the terminal. The project called for the reconstruction and expansion of Terminal E in and around the existing terminal while keeping it operational and safe. The new departure hall includes high ceilings, wood paneling, built-in artwork, and views of the city skyline. Additionally, to reduce curb and roadway congestion at Terminal E, this project also included a new separated roadway system for arrivals and departures.
- **Future Phase –** This phase involves the construction of a new West Concourse, which will add three new gates to Terminal E to accommodate widebody aircraft.

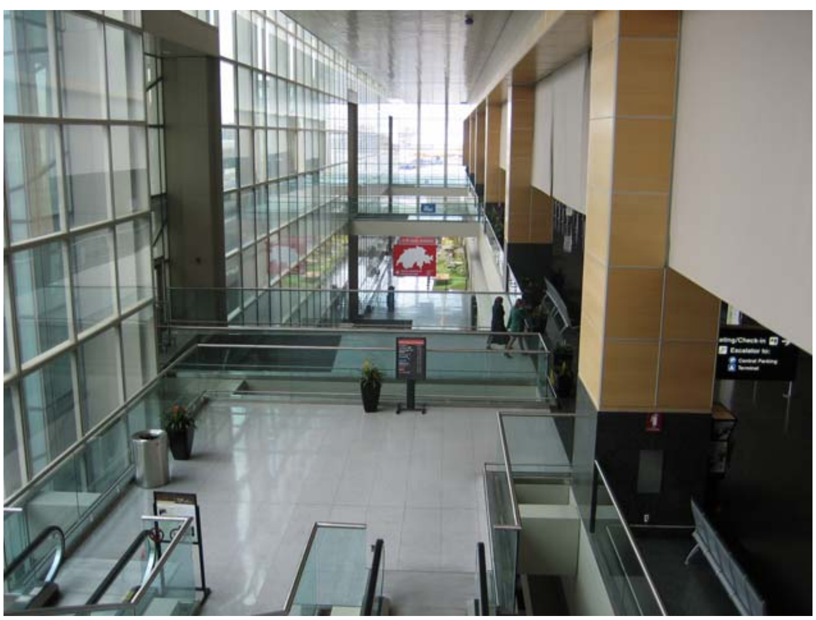
Construction of this project commenced in the summer of 1998. Phase 1 was completed in 2004. The departure level of the new $321 million terminal, including the new ticketing hall and departure level roadway, opened in May 2003. Construction of the new arrivals level was completed in early 2007. Additional information on the status of this project is available in *Chapter 3, Airport Planning.*

Table 9-4 lists each mitigation measure for the International Gateway Project in the Section 61 Findings along with Massport's progress in achieving these measures through the end of 2006.

Figure 9-3 International Gateway Project



Note: Aerial photo taken February, 2006. Runway 14-32 construction completed in November, 2006.



Inside view of Terminal E

Table 9-4	**International Gateway Project Status Report (EOEA #9791) Section 61 Mitigation Measures (as of December 31, 2006)**
Mitigation Measure	**Status**
4.1 Project Design Measures	
Green Technology	
A variety of energy conserving and nonpolluting building materials, systems and equipment will be incorporated into the Project. These include the use of water-saving and flow-reducing devices, high-efficiency motors in the HVAC systems, energy-saving lighting, clearstories to maximize natural lighting, super-insulated walks and ceilings, and low E glass windows to further reduce heat load.	**Completed.** The energy efficient requirements were included in the project design specifications and contract plans. Future phases will include green technology in their design specifications.
Public Art Projects	
An arts and culture program is being developed which will include themes of Boston as part of the international community, as an important cultural center, and as a gateway to New England and the United States.	**Completed.** Includes public art in the ticketing hall and elevated pedestrian walkways.
Sculptures depicting New England culture will be installed in the facility.	**Completed.** Artist-designed terrazzo floors have been installed in the elevated pedestrian walkways to the Central Garage. The walkways to Terminal E were complete in 1998.
400-Hz Power and Pre-conditioned Air	
With the Project, gate power for the aircraft will be provided directly from a central facility, with aircraft preconditioned air provided from "point-of-use" systems at the gate.	**Completed.** Replacement or reconstruction of the terminal jet bridges has been completed. 400-Hz power and pre- conditioned air systems have been installed at the gates.
Alternative Fuel Outreach Program	
Massport is working cooperatively with the EPA and regional utility providers in coordinating an ongoing outreach program aimed at promoting the use of clean-burning alternative fuels. This program, which is also supported by fuel providers, vendors, and state and federal agencies, will offer information to airport tenants in the following areas: ▪ *Notification of grant programs or other financial incentives for vehicle conversions.* ▪ *Assistance in cost-benefit analysis for conversion of conventionally fueled vehicles to alternative fuel vehicles.* ▪ *Assistance in placing airport tenants in contact with alternative fuel suppliers and product vendors.*	**Ongoing.** Massport continues to work cooperatively with Keyspan Energy, AVSG, the City of Boston, and the Massachusetts Clean Cities Coalition to promote the implementation and integration of Alternative Fuel Vehicles into local private and public fleets. In May 2007, Massport adopted two new policies to promote alternative fuel and hybrid vehicle usage at Logan Airport by others: 1) Limited Front-of-line taxi pool privileges; and 2) Preferred Parking locations in the Central Garage and satellite locations. In addition, Massport has been a sponsor and exhibitor at Altwheels, a sustainable transportation festival, since its inception in 2003.
Bi-level Terminal Roadway and Curbside	
The Project will have a bi-level terminal roadway system.	**Completed.** The viaducts connecting Terminal E to the new elevated enplaning roadway and the remainder of the enplaning and deplaning viaducts and roadway systems were completed and opened in May 2003.

Table 9-4 International Gateway Project Status Report (EOEA #9791) Section 61 Mitigation Measures (as of December 31, 2006) (Continued)

Mitigation Measure	Status
Terminal curbs will be designed to promote and enhance the use of HOVs. Curbside areas earmarked for HOV use will be covered by a canopy and waiting structures on the curbside will provide additional protection from the weather.	**Completed.** Construction of the terminal curbs and canopies was completed in December 2003.
Massport will periodically review its current policy, which assigns HOVs to the curb closest to the terminal.	**Ongoing.** HOV access has been incorporated into the final design. Massport assigns HOV buses to the far end of the inner curb, near the exit from the terminal. As a result of analyses for Terminal E and the associated curb layout and traffic flows (conducted in 2002), smaller shuttle buses are now directed to the outer curb.
HOV Promotion	
Massport will reserve terminal space for ground transportation ticket sales, reservations, and information.	**Ongoing.** This space has been provided in a staffed information area in the arrivals area of the new terminal. In a joint venture with MBTA new Charlie Card automated fare collection equipment was installed in all Logan Airport terminals in 2006.
Attractive and distinctive signage and graphics will be utilized inside the terminal and out at the curb to clearly mark access to Logan Express, MBTA, water transportation, and other HOV options.	**Completed.** Signage has been installed in the terminal and at the curbside.
As HOV services continue to develop and expand at Terminal E, Massport will expand its web page to encompass these new services and initiatives.	**Ongoing.** Massport continues to reflect service changes on its website.
Massport and the MBTA will offer, on a trial basis, the sale of MBTA tokens via a vending machine in the baggage claim area of Terminal C.	**Ongoing.** The Logan TMA sells MBTA passes. The MBTA Charlie Pass machines (which recently replaced tokens) are located at the MBTA's new Blue Line Airport Station and Massport continues free service to the station with its CNG bus fleet. As part of an Interagency Agreement with MBTA for operations and maintenance of MBTA Silver Line service to Logan Airport, the two transportation agencies installed the MBTA's new automated fare collection (AFC) equipment in the Logan Airport terminals in 2006.
Connections to the West Garage	
The Project will be designed to allow pedestrian access to the new West Garage via an overhead walkway with moving sidewalks.	**Completed.** Walkways to Terminals A and E and opened concurrent with the opening of the West Garage in September 1998.
Connections to Future Airport Intermodal Transit Connector (AITC)	
The Project is being designed with the flexibility to accommodate access to a possible future AITC station planned adjacent to the terminal.	**Ongoing.** The project design includes this flexibility. The new Silver Line Airport Service includes a stop at Terminal E.
4.2 Construction Period Mitigation	
Traffic Operations Mitigation	
Specific traffic mitigation measures to be employed will include, but not necessarily be limited to, the following: Maintaining full use of the roadways; requiring ingress and egress; requiring acceleration and deceleration lanes; prohibiting on-Airport contractor employee parking; encouraging the use of alternative modes of travel; and requiring police details.	**Ongoing.** Measures to control traffic operations and mitigation of construction equipment were in contract specifications and will continue to be enforced during construction of future phases.

Table 9-4 International Gateway Project Status Report (EOEA #9791) Section 61 Mitigation Measures (as of December 31, 2006) (Continued)

Mitigation Measure	Status
Noise Mitigation	
Noise control techniques will be used to reduce noise from pile driving by at least 5 dBA below unmitigated levels. These techniques include such measures as:	**Ongoing.** Restrictions on construction-related noise were included in the contract specifications, and will continue to be enforced during construction of future phases.
Measures to minimize noise attributable to pile driving; use of concrete crushers; use of local grid power; mufflers, shields or shrouds on construction vehicles; noise-deadening material; equipment maintenance; limiting idling, public address systems; limiting air or gasoline driven hand tools; optimal site configuration; and efficient scheduling of truck loading, unloading and hauling operations to minimize noise.	
Air Quality Mitigation	
Included measures such as performing regular street sweeping; suppressing water spray dust; fencing the perimeters of demolition and construction areas; and covering the trucks.	**Ongoing.** Measures to reduce air quality impacts during construction were included in the contract specifications and will continue to be enforced during construction of future phases.
Overall Project Construction Mitigation	
Massport has hired a construction management (CM) firm which is responsible for overseeing all activities related to the Project. The CM will be responsible for ensuring that the following practices are carried out and adhered to:	**Ongoing.** These measures will be implemented throughout construction.
Full agency coordination; preparation of detailed preconstruction plans; generally limited hours of work; list of construction Do's and Don'ts; transportation management plan; fugitive dust control; preconstruction environmental characterization of soils and groundwater; soils management plan; site-specific Stormwater Pollution Prevention Plan; Health and Safety Plan; encouraging the use of recycled building materials.	
Rodent Control	
During the construction process, regular service visits will be made in order to maintain effective rodent control.	**Ongoing.** Measures to control the rodent population were included in contract specifications and are implemented as needed.
Agency and Community Coordination	
On-site personnel and equipment; maintaining and monitoring the Logan 2000 community response telephone line; participation in an interagency planning/ construction coordination task force; specific construction related performance standards; continuing to meet with the community to provide a forum for addressing community concerns that arise during construction; publication of periodic newsletters advising the public as to the status of the project.	**Ongoing.** Massport regularly meets with interested community groups and provides updates as requested.

Note: Text in italics detailing the mitigation measures is excerpted from the Section 61 Findings submitted to the EOEA, June 26, 1997.

Replacement Terminal A Project - EOEA #12096

Permitting History

- Certificate on the Final EIR issued on November 16, 2000
- Section 61 Findings submitted to EOEA August 31, 2001

Project Status

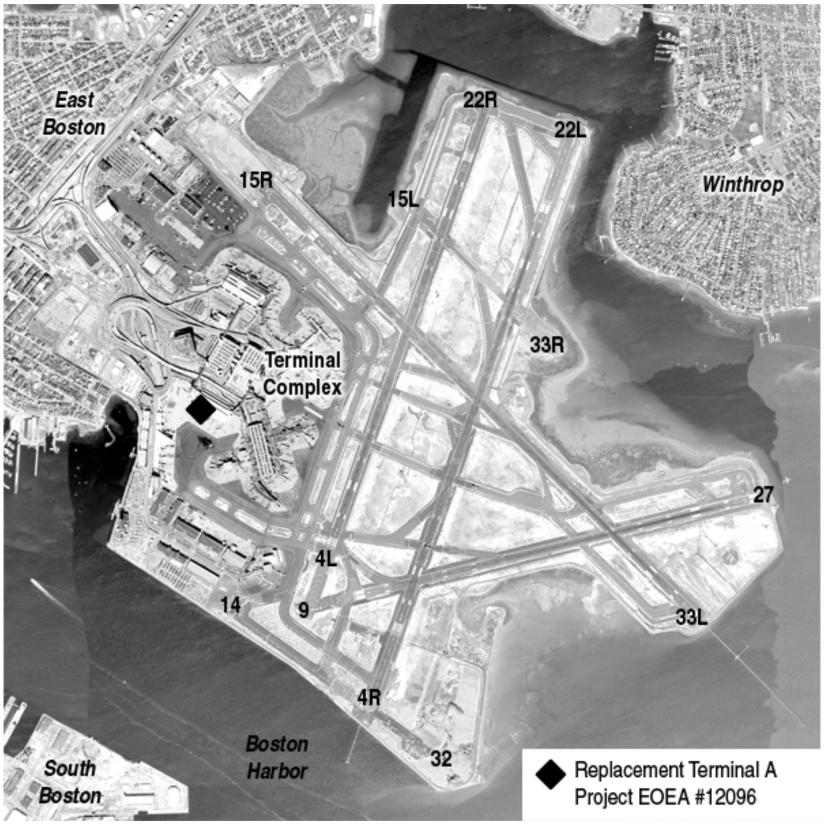
The Replacement Terminal A Project (Figure 9-4) involved the complete demolition of the pre-existing Terminal A and construction of a new facility by Delta Air Lines, consisting of a main terminal linked to a satellite concourse. The old Terminal A was closed in May 2002 and demolition commenced shortly thereafter. The project was designed to be constructed in five phases. However, as a result of September 11, 2001, air traffic at Logan Airport reduced dramatically allowing Massport to relocate the airlines at Terminal A to other terminals with minimal impact, and to shut down Terminal A entirely rather than having to phase construction concurrent with passenger activity. As a result, construction progressed ahead of schedule in 2003 and 2004. Terminal A opened on March 16, 2005.

In the spring of 2006, Delta Air Lines and Massport submitted an application for Leadership in Energy and Environmental Design (LEED™) certification for Terminal A. LEED™ certification was awarded in June 2006, making Terminal A the first airport terminal in the U.S. to be awarded LEED™ certification.

The following sustainable elements were incorporated into the design of Terminal A:

- Water conservation — low-flow toilets, waterless urinals, and drip rather than spray irrigation.
- Atmosphere protection — zero use of chlorofluorocarbon (CFC)-based, hydrochlorofluorocarbon (HCFC) based, or halon refrigerants.
- Energy conservation — special roofing and paving materials that reflect solar radiation.
- Materials and resources conservation — more than 10 percent of all the building materials used to construct the terminal were from recycled materials.
- Enhanced indoor environmental air quality — low and volatile organic compound (VOC) free adhesives, sealants, paints, and carpets were used, and smoking is prohibited inside the terminal building.
- Sustainable sites — bicycle racks were installed in proximity to bus and subway systems.

Figure 9-4 Replacement Terminal A Project



Note: Aerial photo taken February, 2006. Runway 14-32 construction completed in November, 2006.

Table 9-5 lists each mitigation measure in the Section 61 Findings along with Massport's progress in achieving these measures through the end of 2006.

Terminal A Landscaping alongside Harborside Drive

Table 9-5 Replacement Terminal A Project Status Report (EOEA #12096) Section 61 Mitigation Measures (as of December 31, 2006)

Mitigation Measure	Status
Project Design Mitigation	
Green Technology	
The Terminal A Replacement Project will incorporate elements of sustainable design, including state-of-the-art green technologies to conserve energy and minimize pollution during construction and operation of the facility. This will be guided by the LEED Green Building Rating System.	**Completed.** The Replacement Terminal A incorporates various green technologies, including use of non-toxic, recycled and renewable materials; master lighting control systems; photosensors; windows that maximize natural lighting; low E glass that reduces heat load; use of local materials for at least 20 percent of non-mechanical building materials; adhesives and sealants that have no or low VOCs; and water saving fixtures.
Delta will apply to LEED Certification of Terminal A and will use diligent efforts to obtain this certification. Through its design process Delta will report to Massport periodically about its progress in obtaining LEED certification.	**Completed.** Delta Air Lines and Massport achieved LEED™ Certification of Terminal A and that commitment is reflected in the Lease Agreement between Massport and Delta Air Lines. The application was submitted during the spring of 2006 and LEED™ certification was awarded in June 2006.
Urban Design of Replacement Terminal	
Design the new terminal to attenuate noise and to fit in with the visual character of the surrounding area. Incorporate landscaping into the design.	**Completed.** These requirements and considerations were taken into account during design. The satellite terminal acts as a sound barrier to Jeffries Point.
400-MHz Power and Preconditioned Air	
The Terminal A Replacement Project will provide gate power for the aircraft directly from a central facility, with aircraft preconditioned air provided from "point-of-use" systems at the gate.	**Completed.** "Point-of-use" systems have been installed.
TMA Participation	
Delta Air Lines, Inc. has joined Massport's airport employee Transportation Management Association (TMA). Delta will designate an Employee Transportation Advisor at Terminal A to be the conduit between the Airport TMA Coordinator and Delta employees.	**Completed**. Delta Air Lines joined the Logan TMA and designated an Employee Transportation Advisor.
Additionally, Delta will provide the following services as part of their Transportation Demand Management Program through the Airport TMA: Transportation subsidy for full-time Delta employees at Logan; ride matching/carpooling; vanpooling; guaranteed ride home; preferential parking for HOVs; shuttle to and from employee parking.	**Ongoing.** TDM services are provided through the Logan TMA.

Table 9-5 Replacement Terminal A Project Status Report (EOEA #12096) Section 61 Mitigation Measures (as of December 31, 2006) (Continued)

Mitigation Measure	Status
Recycling Program	
The Replacement Terminal A will be included in within Massport's terminal recycling program.	**Ongoing.** Paper, plastic, aluminum, glass and cardboard are recycled at Terminal A.
High Occupancy Vehicle Promotion	
HOV access can be accommodated on the departures level and will be designated near main entrances to the terminal building to ensure efficient and convenient unloading by air passengers who use these mode-types to access the Airport.	**Ongoing.** HOV access has been incorporated into the final design. HOV lanes give HOV modes preferential access to Terminal A for passenger convenience at both the arrival and departure levels.
The inner-most curb of [the arrivals level] will be designated exclusively for HOVs and taxis, similar to the departures level.	The Airport Silver Line service has a dedicated stop at Terminal A on the inner-most curb.
Ground Service Equipment (GSE) Conversion	
In conjunction with the Project, Delta will implement a program for conversion of its entire GSE fleet at Terminal A as soon as viable alternative fueled fleet vehicles become available and can be effectively integrated into Delta's operations at Terminal A.	**Ongoing.**
Delta will introduce battery powered baggage tugs and belt loaders with the replacement terminal and convert this portion of the GSE fleet by the end of 2008. This represents over 40 percent of Delta's current GSE fleet.	**Ongoing.** The Terminal A design incorporates infrastructure for GSE charging.
Delta will also examine the feasibility of locating a Compressed Natural Gas (CNG) fill station at Terminal A. The availability of a CNG fueling station would facilitate conventionally-fueled vehicles to be replaced with CNG-fueled vehicles where this vehicle option is offered. Delta will introduce these vehicles into its GSE fleet as soon as they become available and are determined to be feasible and practicable for use at Terminal A.	**Ongoing.** Delta Air Lines examined the feasibility of locating the CNG fill station at Terminal A and determined it to be infeasible given that the GSE conversions are trending toward electric vehicles. A CNG fuel facility is available on the Airport.
Where new alternative fuel vehicles are developed and determined to be cost effective and in available supplies, Delta will integrate their use into its Terminal A GSE fleet operations.	**Ongoing.** Delta Air Lines has committed to electric baggage tugs and belt loaders and will continue to determine the feasibility of integrating other alternative fuel GSE.
Finally, Delta will provide Massport with an annual status report/update on the GSE conversion program at Terminal A, for inclusion in Massport's annual ESPR.	**Ongoing.** Terminal A includes electric charging stations for Delta Air Lines' electric ramp vehicles. Delta Air Lines is studying which alternative fuel vehicles and infrastructure are best suited for its future GSE operations. Delta Air Lines will provide Massport with an annual status report on the GSE conversion program at Terminal A.

Table 9-5 Replacement Terminal A Project Status Report (EOEA #12096) Section 61 Mitigation Measures (as of December 31, 2006) (Continued)

Mitigation Measure	Status
Pedestrians traveling between the West and Central Garages will be provided with enclosed elevated walkway connections between the terminal and the two parking garages. The walkways will be designed with features such as climate controls and other design features that will allow for safe and comfortable passage between the terminal and garage structures.	**Completed.** Terminal A includes two enclosed connections to the existing Airport-wide pedestrian bridge system. There is a new bridge at the west end of the ticketing hall that reestablishes the connection to the pedestrian bridge to the West Garage and the Hilton Hotel. At the east end of the ticketing hall, a new bridge connects to the existing walkway between the Central Garage and Terminal B.
Pedestrian connections will be improved by the following measures: connections to elevated walkways, improved crosswalks, surface walks.	**Completed.** These measures have been incorporated in the final design and include the connections to the garages and Terminal B as described above. The Arrivals level roadway design includes three crosswalks that are aligned symmetrically with the terminal exit vestibules. The project provides a new sidewalk along Harborside Drive.
Operational Mitigation Measures	
Minimizing nighttime movement of aircraft to and from hardstand positions.	**Ongoing.** In 2006, Delta Air Lines parked all aircraft at gates. To the extent that hardstands may be needed in the future, Massport will work with Delta Air Lines to minimize the extent of nighttime movement.
Using single engine taxiing and pushback to the extent feasible and practicable, recognizing that such use always at the discretion of the pilot in charge of the aircraft based upon his or her experience and safety and operational considerations.	**Ongoing.** This measure is being implemented. In August 2006, Massport sent letters to all airlines operating at Logan Airport encouraging the voluntary use of single-engine taxiing, consistent with safety requirements, pilot judgment and the requirements of federal laws.
Testing alternative de-icing methods to reduce the amount of glycol usage.	**Ongoing.** Delta Air Lines will continue to investigate de-icing alternatives.
Construction Period Mitigation	
Construction period mitigation will be incorporated into the contract documents and specifications governing the contractors and subcontractors constructing the Terminal A Replacement Project.	**Completed.** Construction period mitigation requirements were in the contract specifications and were enforced during construction.
Massport and Delta will employ a team of on-site resident engineers and inspectors to monitor contractors' compliance with all mitigation measures. These measures may be adjusted, as appropriate, to assure continued effectiveness in supporting Massport's construction period mitigation objectives.	**Completed.** Construction period mitigation requirements were in the contract specifications and were enforced during construction.
Specific construction period mitigation is described below: Traffic Mitigation, Noise Mitigation, Air Quality Protection, Overall Project Construction Mitigation, Rodent Control.[1]	**Completed.** Construction period mitigation requirements were in the contract specifications and were enforced during construction.

Note: Text in italics detailing the mitigation measures is excerpted from the Section 61 Findings submitted to the EOEA, August 31, 2001.
1 Details are available in the Section 61 Findings.

Logan Airside Improvements Planning Project – EOEA #10458

Permitting History

- Certificate on the Final EIR issued on June 15, 2001.
- Section 61 Findings dated June 8, 2001 on the Final EIR.
- In June 2002, the FAA filed a Final Environmental Impact Statement (FEIS) and issued the Record of Decision (ROD) in August 2002 approving a unidirectional runway and other improvements, but deferred a decision on the Centerfield Taxiway pending additional review by the FAA.
- In November 2003, the Superior Court of the Commonwealth modified a 1976 injunction prohibiting construction of a new runway at Logan Airport, pending further environmental review. The injunction modification allowed construction of the runway in accordance with the MEPA Certificate on the Final EIR and the FAA's ROD on the Final EIS.
- In accordance with the Secretary's Certificate on the Final EIR, Massport amended its final Section 61 Findings issued in 2001 to incorporate mitigation measures added or refined through the federal environmental review process. As a result, Massport amended its initial Section 61 Findings on October 21, 2004 to include mitigation measures required of it in the FAA's ROD.
- In April 2007, the FAA issued a ROD on the Centerfield Taxiway Improvements based on its review of supplemental information.

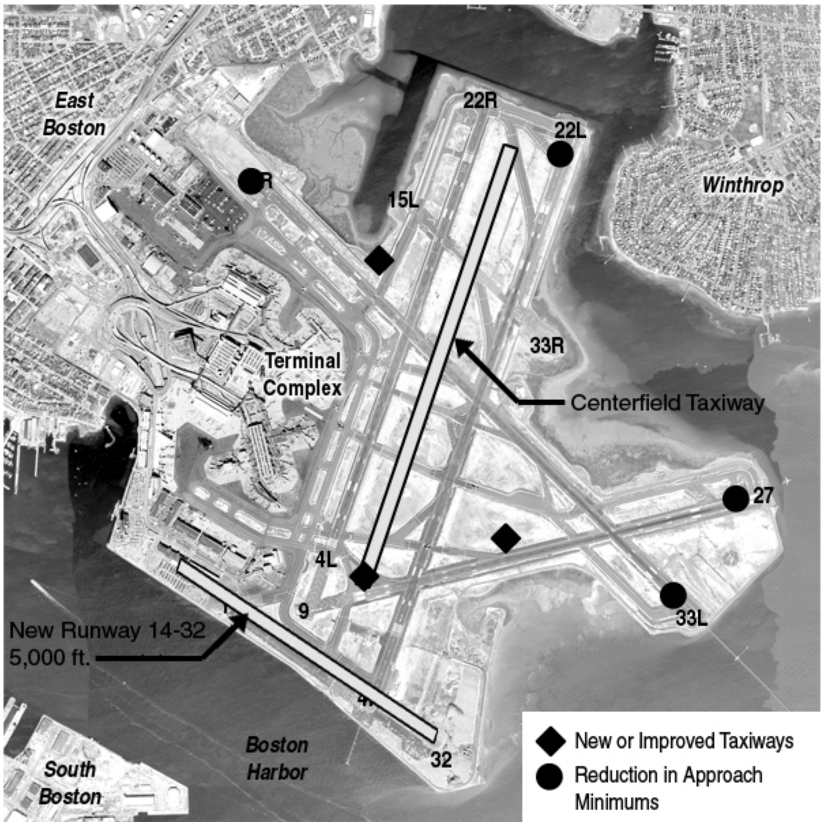
Project Status

- Project construction commenced in 2004. Runway 14-32 opened on November 23, 2006.
- Construction of Taxiway Improvements commenced in the fall of 2007.

The Logan Airside Improvements Planning Project (Figure 9-5) involves the construction of a new unidirectional Runway 14-32 and Centerfield Taxiway, extension of Taxiway D, realignment of Taxiway N, improvements to the southwest corner taxiway system, and reduction in approach minimums on Runways 22L, 27, 15R, and 33L. Reduction in approach minimums on Runway 15R and 33L were approved in the EIS. However, implementation depends upon realignment of the Instrument Landing System (ILS) localizer. Relocation of the ILS localizer is awaiting completion of the environmental review of the Runway Safety Area enhancements for Runway 33L.

Table 9-6 summarizes the mitigation measures contained in the amended Section 61 Findings issued on October 21, 2004 and reports on the status of implementation.

Figure 9-5 Logan Airside Improvements



Note: Aerial photo taken February, 2006. Runway 14-32 construction completed in November, 2006.

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Table 9-6 Logan Airside Improvements Planning Project (EOEA #10458)
Details of Ongoing Section 61 Mitigation Measures (as of December 31, 2006)

Mitigation Measure	Status
Project Design and Mitigation Measures	
Runway 14-32 Operations and Construction Mitigation	
Operational procedures for unidirectional Runway 14-32 will include over water flight operations only, arrival operations in east-to-west direction from Runway 32 approach end, and departure operations from west-to-east direction from the Runway 14 departure end. Massport will enter into contract with appropriate government body and/or community group(s) to enforce intended unidirectional runway, if requested. Lighting, marking, and instrumental components of Runway 14/32 will be designed for a unidirectional runway. No parallel or other type taxiway facility will be constructed to allow east-to-west direction departures from the Runway 32 end. *FAA endorsed the unidirectional limitations on Runway 14-32 and has agreed to develop air traffic control procedures to ensure safe and efficient operation of the unidirectional limitation, subject to variances that may be required to accommodate particular aircraft emergencies.*	**Completed.** Runway 14-32 was constructed for unidirectional operation. All lighting, marking and navigational instrumentation was constructed and is operated for unidirectional use only. There is no parallel or other type of taxiway facility that would facilitate east-to-west direction departures from the Runway 32 end. The construction mitigation measures were incorporated into the final design specifications and were implemented during construction. Runway 14-32 opened on November 23, 2006.

Table 9-6 Logan Airside Improvements Planning Project (EOEA #10458)
Details of Ongoing Section 61 Mitigation Measures (as of December 31, 2006) (Continued)

Mitigation Measure	Status
Wind-Restricted Use of Runway 14-32	
Restrict the use of Runway 14-32 to those times when winds are equal to or greater than 10 knots from the northwest or southeast (between 275 degrees and 005 degrees, or 095 degrees and 185 degrees, respectively).	**Ongoing.** Massport compiles the necessary data and cooperates with FAA to facilitate its effort to implement the wind restriction in compliance with the federal ROD.
Mitigation Policies/Programs	
Regional Transportation Policy	
Engage in promoting increased utilization of regional airports *Cooperative transportation planning with the various transportation agencies to ensure an integrated regional transportation infrastructure, i.e., improved highways, public transportation, high-speed rail, private transportation services to improve regional airport access.*	**Ongoing.** During 2001, Massport, together with the FAA and the six New England Regional State Aviation Directors developed a scope of work and selected a technical team to undertake the New England Regional Aviation System Plan (NERASP) Update study. In 2002, the Massport Board approved 10 percent funding with a 90 percent federal match toward the $1.6 million study. Phase 1 of the study was published in October 2006 and is available at www.nerasp.com.
Massport will continue to exercise operational control over Worcester Regional Airport.	**Ongoing.** The Authority continues to exercise operational control over Worcester Regional Airport as part of Massport's agreement with the City of Worcester which went into effect on January 15, 2000. In April 2004, Massport and the City of Worcester agreed to a three year extension of the Operating Agreement, extending Massport's operation of the Logan Airport through June 2007. Subsequently, both parties have agreed to a further extension to December 2007.
Massport will continue to attract new air service to Worcester Regional Airport.	**Ongoing.** Following the events of September 11, 2001, the last commercial operator, US Airways Express, ceased operations out of Worcester in early 2003. In 2003 and 2004, Massport continued to work with the City to attract passenger service for the Worcester Regional Airport. New service by Allegiant Airways commenced in December 2005 but ceased in September 2006.
Traveler and air service awareness will be provided to Worcester Regional Airport via marketing campaigns.	**Ongoing.** In 2001, the Massport Board approved $300,000 for the promotion of the Worcester Regional Airport. The marketing campaign consisted of radio, print, the internet (travel agents), outdoor and "out of home/mall" advertising. The advertising campaign was suspended due to the financial impacts of September 11, 2001. It was resumed and again suspended for a second time due to the lack of commercial service.
Develop and maintain an aviation information database to include: aviation trend tracking reports for distribution to interested parties; statistical summaries of passenger levels, aircraft operations and airline schedule data at major New England regional airports; include a summary of regional airport trends and service developments an Annual Report.	**Ongoing.** Massport collects regional airport data. A detailed summary of individual airport activity is published annually in the EDRs. Massport was also the prime contractor for the NERASP, which is available in full at www.nerasp.com.

**Table 9-6 Logan Airside Improvements Planning Project (EOEA #10458)
Details of Ongoing Section 61 Mitigation Measures (as of December 31, 2006) (Continued)**

Mitigation Measure	Status
Participate in other regional/state aviation forums.	**Ongoing.** The NERASP study was completed in the fall of 2006. It is discussed in *Chapter 4, Regional Transportation* of this *2006 EDR* and can be found on the website noted on the previous page. Massport continues to participate in regional and state aviation forums as they exist.
Continue to work with FAA/regional airport directors to complete a New England Airports System Study to evaluate regional airports performance. FAA committed to work with other participants in the preparation of the study.	**Completed**. The NERASP Study was published in October 2006.
Encourage transportation initiatives (i.e., commuter rail, rail or other links between regional airports) by relevant agencies or other governmental bodies through Transportation Bond Bill or other legislative initiatives to implement an improved effective regional transportation system.	**Ongoing.** Massport transportation initiatives include support for legislation at the local, state, and federal levels. Massport continues to provide support for regional transportation legislation and funding for other modes of transportation including the MBTA Silver Line, water transportation. Massport's continued support was instrumental in the 2001 opening of the Anderson Regional Transportation Center in Woburn which provides a station building for ticketing, baggage and passenger services, approximately 2,400 parking spaces for daily and overnight parking, loading platforms for Logan Express and local buses, improved access from I-93 via a new interchange constructed and opened by MassHighway, and a new high-level platform commuter rail station.
Continue to assist in the development of a comprehensive rail plan for New England.	**Ongoing.** Past examples of Massport's assistance in development of a rail plan for New England**:** In 2001, the Executive Office of Transportation and Construction (EOTC), the New Hampshire Department of Transportation (DOT) and the Vermont DOT hired a consultant team to perform a feasibility study for high-speed rail from Boston to Montreal. In addition to automobile, bus and rail travel surveys, Massport facilitated the consultant team's passenger survey at Logan Airport to identify modes of travel to the Airport.
Continue to support inter-city rail planning through the Boston Metropolitan Planning Organization (MPO).	**Ongoing.** Massport continues to participate in the Boston MPO and contributes to the policy discussions in all modes of transportation.
Allow Massport's Logan Express satellite parking lots and stations available for third-party bus and park-and-ride connections to other regional airports, including Worcester, Manchester, and Providence.	**Ongoing.** Upon request and review, Massport will continue to allow third party bus operators to provide service to regional airports from Logan Express facilities. As of the date of this report, Massport has an agreement with Manchester-Boston Regional Airport to allow operation of a new shuttle service between Manchester-Boston Regional and the Woburn Anderson Regional Transportation Center (RTC).

Table 9-6 Logan Airside Improvements Planning Project (EOEA #10458)
Details of Ongoing Section 61 Mitigation Measures (as of December 31, 2006) (Continued)

Mitigation Measure	Status
Residential Sound Insulation (RSIP)	
Sound insulation will be provided in the newly defined 1999 contour that will include affected residences in Chelsea, East Boston, and South Boston. Through special project mitigations, FAA funding will be provided for residences with building code considerations to allow for the necessary upgrades thereby ensuring eligibility and participation in the sound insulation program. If FAA funding is unavailable to complete sound insulation to residences within the new 65 db DNL contour as a result of project implementation, Massport will provide the funding. *The FAA has committed to provide funding for a Massport sound insulation program to address noise exposure within the 65 DNL contour that results from the implementation of the EIS Preferred Alternative for the Project as mitigated by the 10-knot wind restriction. In the event Federal funding is not available, Massport reiterates its commitment to provide funding for eligible homes. FAA also has agreed to fund building code upgrades to the extent necessary for sound insulation.*	**Ongoing.** The RSIP is being implemented in full compliance with state and federal regulatory requirements and mitigation commitments.
Tenant Relocation Assistance	
Construction of Runway 14-32 will result in the demolition of Cargo Buildings 60 and 61. Massport will provide assistance to eligible tenants in Building 60. The tenant of Building 61 will vacate. *FAA has committed to ensure that Massport's tenant relocation program is followed through appropriate conditions in federal grants. Massport will continue to comply with its commitments with respect to tenant relocation.*	**Completed.** The tenant in Building 61 vacated the premises upon expiration of its lease. Massport provided relocation assistance to the eligible businesses in Building 60.
Vegetation	
Sediment and erosion controls will be implemented within the 100-foot buffer zone of the coastal bank.	**Ongoing.** Sediment and erosion controls were installed on Runway 14-32 prior to construction and will be maintained until disturbed areas are suitably stabilized.
Areas disturbed by construction will be stabilized with vegetation common to airfield once re-grading is completed.	**Ongoing.** Massport will stabilize the areas disturbed by construction once re-grading is completed.
Wildlife	
Alter existing airfield grassland mowing procedures prior to spring arrival of upland sandpiper to encourage occupation in other airfield areas other than the construction area implement a pre-construction upland sandpiper inspection program and conduct on-going pre-mowing to ensure no individual birds remain in the area, and encourage off-site habitat due to airfield safety.	**Ongoing.** Massport will proceed with these measures as the improvements are implemented.

Table 9-6 Logan Airside Improvements Planning Project (EOEA #10458)
Details of Ongoing Section 61 Mitigation Measures (as of December 31, 2006) (Continued)

Mitigation Measure	Status
Water Resources	
The existing storm-water drainage system will be reconfigured and a low-flow water quality treatment structure will be incorporated, if feasible.	**Ongoing.** Massport incorporated these design specifications as part of the project's construction plan. Two water quality treatment structures have been integrated into the final design of the project.
FAA has reiterated the provisions of Section 7.0 of the Section 61 Findings and has committed to ensure compliance with these requirements and water quality Best Management Practices (BMPs) through its engineering oversight of the Project.	**Ongoing.** Project design has incorporated water quality elements and BMPs as described in the Final EIR. BMPs were implemented during project construction and operation of the runway. Similar measures will be taken during Centerfield Taxiway construction.
Preferential Runway Advisory System (PRAS)	
Massport will develop and implement a PRAS monitoring system and a new distribution system for reporting that will expand the contents of Massport's Quarterly Noise Reports and will involve the expansion of the distribution list to include the Logan Airport Citizens Advisory Committee (CAC). Runway utilization, dwell and persistence reports will be included in the ESPR filings with MEPA. Massport will continue to work with FAA to design additional reports to enhance the attainment of PRAS and Massport will begin to work with CAC to update PRAS. The current PRAS system will remain in place until superseded.	**Ongoing.** Massport, FAA, and the CAC initiated a noise study of Logan Airport. PRAS review and reporting are incorporated into the requested noise study. Runway utilization, dwell and persistence reports continue to be included in ESPR and EDR filings with MEPA.
Noise Abatement Study	
FAA has committed to undertake a noise abatement study that will include enhancing existing or developing new noise abatement measures applicable to aircraft overflight impacts, which will take into account environmental benefit, operational impact, aviation safety and efficiency, and consistency with applicable legal requirements. The scope of this study has been completed through the joint efforts of FAA, the CAC, and Massport as required by the ROD. Massport will work with the CAC and FAA to assess the existing PRAS at Logan in accordance with Section 10.0 of the Section 61 Findings and will continue to participate in the noise study as contemplated in the ROD.	**Ongoing.** The FAA, in conjunction with Massport and the Logan Airport CAC, initiated the Boston Overflight Noise Study. Phase 1 of the study, completed in early 2007, defined and will seek to implement changes to flight tracks to minimize impacts from aircraft overflights which do not require a detailed EA. Phase 2, now underway, will address additional noise abatement alternatives that will require detailed analysis to meet FAA environmental requirements. Federal funding for Phase 2 was requested early to ensure seamless continuation of the study and transition.
Peak Period Monitoring and Demand Management Program (DMP)	
Massport will develop and implement a Peak Period Pricing (PPP) program or an alternative DMP. Massport will identify standards to allow airlines to accurately predict scheduling costs and modify accordingly. Massport will establish and maintain a monitoring system. Massport will comply with its commitments with respect to PPP or alternate DMP. FAA has indicated in the ROD that it stands ready to assist Massport in this endeavor.	**Ongoing.** In July 2004, Massport filed a proposed rule with the Office of the Massachusetts Secretary of State to formally initiate the state rulemaking process and public review of a proposed rule to establish a peak period surcharge during designated peak delay periods at Logan Airport. The filing was followed by a public comment period that lasted through November 15, 2004. During the comment period, Massport conducted two public hearings to receive comments on the proposed regulation. The Massport Board voted to establish the peak period surcharge program on January 16, 2005. The program has been in place since that date. *Appendix L, 2006 Peak Period Pricing Monitoring Report* of this *2006 EDR* includes a copy of Massport's Peak Period Pricing Monitoring Report for 2006.

Table 9-6 Logan Airside Improvements Planning Project (EOEA #10458)
Details of Ongoing Section 61 Mitigation Measures (as of December 31, 2006) (Continued)

Mitigation Measure	Status
Single-Engine Taxi Procedures	
Develop and implement a program designed to maximize the use of single-engine procedures by all tenant airlines, consistent with safety requirements, pilot judgment and Federal law requirements.	**Ongoing.** In 2006, the Massport Director of Aviation sent letters to all airlines operating at Logan Airport encouraging the use of reduced engine taxiing consistent with safety, pilot judgment, and federal laws. Massport will follow up with airlines as appropriate.
General Construction Mitigation	
Traffic Mitigation	
Construction vehicles will use the Airport roadway system/State highways and be restricted from using Neptune Road, Maverick Street and Porter Street in East Boston. Construction employees (with the exception of some supervisory personnel) will be prohibited from on-site/on-Airport parking and will access the Airport via public transportation or shuttle service from designated off-site parking. Police details will be employed to ensure safety and to manage traffic at appropriate locations.	**Ongoing.** Construction mitigation measures and practices were and will be maintained during construction.
Air Quality Mitigation	
Require contractors to retrofit heavy construction equipment with advanced pollution control devices. Control dust by: street sweeping; applying water as needed and covering trucks hauling demolition and excavation site materials.	**Ongoing.** Construction mitigation measures and practices were and will be maintained during construction.
Noise Mitigation	
Noise Control Techniques include the use of concrete crushers; use of local power grid to reduce generator use; attaching of intake and exhaust mufflers, shields or shrouds; use of noise deadening material to inside of hoppers, conveyor transport points, or chutes; ongoing equipment maintenance to ensure peak performance; limit equipment idling; limit use of public address systems/annunciators; limit use of gasoline driven hand tools; configure, where feasible, the construction site will be as far from noise-sensitive locations as possible. Nighttime construction schedule noise measures will be implemented including: prohibit, to appropriate extent, back-up alarms for all equipment; provide additional construction laborers to ensure backup safety and to comply with OSHA regulations; prohibit delivery trucks from tailgate slamming during paving operations; require contractors to turn off vibratory compactors prior to exiting off newly placed pavement and onto old existing pavement.	**Ongoing.** Construction mitigation measures and practices were and will be maintained during construction.
Overall Construction Mitigation Monitoring	
Pre-construction Plans	
Develop a HASP, a site-specific Construction Stormwater Prevention Plan , a site Soil Management Plan, adopt Massachusetts Clean Air Construction Initiatives, develop Construction Employee Transportation Management Plan, develop detailed traffic maintenance plans, and develop construct specifications and standards for all contractors.	**Completed.** Pre-construction plans were developed prior to commencement of construction in 2004.

**Table 9-6 Logan Airside Improvements Planning Project (EOEA #10458)
Details of Ongoing Section 61 Mitigation Measures (as of December 31, 2006) (Continued)**

Mitigation Measure	Status
Preferred Alternative Site Control/Security	
Conduct full agency coordination with the FAA, MBTA, MTA, MDEP, CZM, MWRA, BWSC and utility companies. Established an on-site team of resident engineers and inspectors.	**Completed.**
Report on Progress of TMA	**Ongoing.** *Chapter 5, Ground Transportation* of the *2006 EDR* discusses the current status of the Logan TMA and ongoing efforts to increase Logan TMA membership and overall HOV access to Logan Airport. Since MassRIDES began management of the Logan TMA in January 2006, the joint focus has been on expanding Logan TMA services, broadening HOV options, and working to see that all major Logan Airport tenants become members and actively participate in the Logan TMA.

Note: The mitigation measures in italics are those that were referenced in the FAA's ROD and later incorporated into the October 21, 2004 amended Section 61 Findings.

A

MEPA Certificate and Responses

- Secretary of Environmental Affairs Certificate on the *Logan Airport 2005 Environmental Data Report (2005 EDR)* and Massport's Responses to Comments raised in the Certificate.
- Copies of Secretary of Environmental Affairs Certificates issued for the reporting years 1995 through 2004.

Secretary of Environmental Affairs Certificate on *2005 EDR* and Massport's Responses to Comments Raised in the Certificate

The Commonwealth of Massachusetts
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February 15, 2007

CERTIFICATE OF THE SECRETARY OF ENVIRONMENTAL AFFAIRS
ON THE
2005 LOGAN AIRPORT ENVIRONMENTAL DATA REPORT

PROJECT NAME	: 2005 Environmental Data Report
PROJECT MUNICIPALITY	: Boston / Winthrop
PROJECT WATERSHED	: Boston Harbor
EOEA NUMBER	: 3247
PROJECT PROPONENT	: Massachusetts Port Authority
DATE NOTICED IN MONITOR	: December 23, 2006

As Secretary of Environmental Affairs, I hereby determine that the Environmental Data Report submitted on this project **adequately and properly complies** with the Massachusetts Environmental Policy Act (G. L. c. 30, ss. 61-62H) and with its implementing regulations (301 CMR 11.00).

The environmental review process at Logan Airport has been structured to occur on two levels: airport-wide and project-specific. The Environmental Status and Planning Report (ESPR) has evolved from a largely retrospective status report on airport operations to a broader analysis that also provides a prospective assessment of long-range plans. It has thus become (consistent with the objectives of the MEPA regulations) part of Massachusetts Port Authority's (Massport) long range planning. The ESPR provides a "big picture" analysis of environmental impacts associated with current and anticipated levels of activities, and presents an overall mitigation strategy aimed at avoiding increases in such impacts. The ESPR analysis is supplemented by (and ultimately incorporates) the detailed analyses and mitigation commitments of project-specific EIRs. The ESPR is currently updated on a five-year basis, with much less detailed Environmental Data Reports (EDR) filed in the years between submission of the ESPRs. The 2005 EDR is the subject of this Certificate.

EOEA# 3247 EDR Certificate 02/14/07

Background

In 1979, the Secretary of the Executive Office of Environmental Affairs (EOEA) issued a Certificate requiring Massport to define, evaluate, and disclose, every three years, the impact of long-term growth at the airport through a Generic Environmental Impact Report (GEIR). The Certificate also required the submission of interim Annual Updates to provide data on conditions for the years between the GEIRs. The GEIR provided projections of environmental conditions where the cumulative effects of individual projects could be understood. The Secretary's Certificate on the *1997 Annual Update* proposed a revised environmental review process for Logan Airport. As a result, Massport evaluates the cumulative impacts associated with airport activities through preparation of an ESPR every five years and provides data updates annually through the EDRs.

Review of the 2005 EDR

In general, the EDR has fulfilled its purpose of providing a "snapshot" of year 2005 passenger and impact levels at Logan Airport. Most environmental parameters showed significant improvement in calendar year 2005. In particular, the technical studies in the 2005 EDR included reporting on and analysis of key indicators of airport activity levels, airport planning, the regional transportation system, ground access, noise, air quality, environmental management, and project mitigation tracking.

As always, EOEA remains committed to evaluating and addressing the cumulative impacts of airport operations on the nearby communities. In June 2001, Massport agreed to work with EOEA on structuring a proposed Air Quality Initiative (AQI). The Certificate indicated that Massport was "to solicit project submissions from local governments and community groups, which will be reviewed in an objective, science-based process by a neutral organization such as NESCAUM." The 2005 EDR reiterates that Massport has committed to the Air Quality Initiative, a key program designed to mitigate the cumulative air quality impacts of airport
S-001-001 operations. The 2005 EDR details how Massport is meeting this commitment. The 2006 EDR should continue to report on the details of Massport's committment. In addition to the
S-001-002 environmental issues listed below, the 2006 EDR should address all of the air quality and noise related issues raised by the commenters during the review of the 2005 EDR.

Follow-up

S-001-003 Massport should file the next EDR (covering operations for the 2006 calendar year) in calendar year 2007. The EDR should provide more of a "snapshot" of the 2006 operations and impacts, with more substantial analysis awaiting the next GEIR. Massport should also address the comments received on the current EDR when developing its 2006 EDR.

Responses to Comments

S-001-004 The next EDR must include Responses to Comments which addresses all of the substantive comments from the letters listed at the end of this Certificate. The Response to Comments

2

S-001-001

Massport's commitment to the 15-year Air Quality Initiative (AQI) is reiterated and updated in this *2006 Environmental Data Report (2006 EDR)*. See *Chapter 7, Air Quality/Emissions Reduction* for details.

S-001-002

Chapter 6, Noise Abatement and *Chapter 7, Air Quality/ Emissions Reduction* address all comments that were raised during review of the *2005 EDR*.

S-001-003

The filing and review schedule of this *2006 EDR* complies with this request. In some cases, where it makes sense to provide such context, a limited historical trend discussion is provided, otherwise the *2006 EDR* provides a snapshot of 2006 conditions.

S-001-004

Appendix A, MEPA Certificate and Responses, and *Appendix B, Comment Letters and Responses* of this *2006 EDR* contain Massport's responses to the substantive comments raised on the *2005 EDR.* The responses provided are specific in terms of addressing the questions raised and the comments made by each commentor. In some cases, the relevant chapter of the *2006 EDR* has been expanded to address issues raised in comments.

included in this EDR is well-constructed and cross-referenced. Massport may follow the same format in addressing comments in the next EDR, although the Responses to Comments should pay particular attention to increased specificity, where necessary.

The majority of comments received on the 2005 EDR focused on air quality and noise related issues, including measurement of noise, modeling of noise contours, and noise abatement. In S-001-005 addition to responding to these comments, the 2006 EDR and future EDRs should also continue to report on the refinements to noise tracking and abatement efforts.

Activity Levels

The Activity Levels chapter presents aviation activity statistics for Logan Airport in 2005 and compares activity levels to the prior year including air passengers, aircraft operations, fleet mix, and cargo/mail volumes. Air passenger traffic at Logan Airport continued to rebound in 2005, but remained below the peak year level reached in 2000. Specifically, the total number of passengers using Logan Airport in 2005 increased by 3.6 percent over the prior year to 27.1 million passengers. In 2005, total aircraft operations (409,066 operations) at Logan Airport increased by 0.9 percent over 2004 levels. While 2005 passenger traffic at Logan Airport was approximately equal to 1999 levels, in 2005 these passengers were being carried on approximately 86,000 fewer S-001-006 flights (495,000 flights in 1999 versus 409,066 flights in 2005). Several commenters raised concerns with the increase in passenger levels requesting long-term solutions to meeting demand which do not include expansion of Logan Airport's capacity or footprint. I advise Massport to consider and attempt to address these comments in the next 20006 EDR.

Planning

The Airport Planning chapter provides an overview of planning, construction, and permitting activities that occurred at Logan Airport in 2005. It also describes known future planning, construction, and permitting activities. Specifically, several projects were completed in 2005 including the majority of construction of the main terminal and satellite concourse of Delta Air Lines' Replacement. Terminal A Project was completed in 2004, with final fit up and commissioning in 2005. Massport also launched Exit Express as part of an on-going program to improve parking facilities and improve air quality through enhanced circulation and reduced idling at the toll booths. In addition, as part of a cooperative venture between the Massachusetts Bay Transportation Authority (MBTA) and Massport, initial Silver Line service to the airport began in December 2004. Full Silver Line service to Logan Airport began on June 1, 2005.

The chapter also includes future planning including: ongoing expansion and upgrade of Terminal E and completion of West Garage Phase II(Central Garage Expansion); more efficient ways of using the limited land resources in the service areas; airside improvements include upgrades and improvements to the airfield to enhance the operations, efficiency and safety of Logan Airport; In addition, buffer areas are being designed in consultation with Logan Airport's neighbors and other interested parties in a community planning process. Massport is also considering a parking strategy to address future on-airport parking demands. Some ongoing and future parking projects and planning concepts include redeveloping three parcels into a combined economy parking

S-001-005

Chapter 6, Noise Abatement of the *2006 EDR* provides an update of Massport's noise tracking and abatement efforts through December, 2006, and where appropriate, includes noteworthy updates that have occurred beyond the 2006 reporting year, in 2007.

S-001-006

Although total air passengers increased in 2006, reaching 27.7 million passengers (up from 27.1 million in 2005), total aircraft operations declined from 409,066 in 2005 to 406,119 in 2006. This decrease in operations is due to airlines increasing their load factors (the number of passengers per aircraft operation). Massport recognizes the future need to examine/develop long term measures to meet projected demand and anticipates appropriately addressing this in the future EDRs/ Environmental Status and Planning Reports (ESPRs).

facility with the capacity for up to 1,750 vehicles and a new consolidated facility for all car rental operations.

Regional Transportation

This chapter describes activity levels at New England's regional airports in 2005 and updates recent planning activities. Overall, the number of air passengers utilizing New England's primary commercial service airports in 2005 rose by 5.3 percent over 2004. When measured by aircraft operations, however, activity levels fell by 0.6 percent. This reflects sweeping changes in both the commercial aviation and general aviation (GA) sectors of the industry. Passenger numbers rose despite capacity reductions as airlines operated at higher load factors. Carriers flew fewer flights to the regional airports than in 2004, but used larger aircraft on average in 2005, and carried more passengers. GA operations at New England airports declined by 3.8 percent from the 2004 levels. The Boston Transportation Department has raised a number of suggestions related to the Regional Transportation that Massport should consider in the 2006 EDR.

Ground Transportation

This chapter reports on transit ridership, roadways, traffic volumes, and parking for 2005. Specifically, ground transportation activity levels increased from 2004 to 2005 as a result of a 3.6 percent increase in the number of air passengers. In addition, traffic volumes on airport roadways increased by 5.8 percent, while the vehicle miles traveled (VMT) on the airport increased by 4.2 percent. The lower VMT growth when compared to overall traffic volume growth suggests that more direct connections over shorter roadway distances are provided. The facilities at the MBTA Blue Line Airport Station were also substantially improved in 2005, including the conversion from a manual to an automated fare collection system. In addition, full MBTA Silver Line service to Logan Airport began on June 1, 2005. In 2005, Terminal A and its associated access roadways were fully opened for operation. There were no other roadway modifications completed in 2005. In addition, contract negotiations began between Massport and the C & J Bus Company in New Hampshire to expand early morning transportation between New Hampshire and Logan Airport. This service began in 2006. Massport also re-bid its Logan Airport Transportation Management Association (Logan TMA) contract with the Executive Office of Transportation (EOT) through the MassRIDES program.

Noise

The Noise Abatement chapter updates the status of the noise environment at Logan Airport in 2005, and describes Massport's efforts to reduce noise levels. In 2005, the number of people exposed to Day-Night Sound Level (DNL) values greater than 65 decibels (dB) decreased compared to 2004. An estimated 6,477 people were exposed to DNL levels greater than 65 dB in 2005, compared to 9,438 in 2004, and 7,183 in 2003. The total count of people exposed to 65 dB Day-Night Sound Level (DNL) and above was 55 percent lower than in 2001. Winthrop, which has always experienced the highest levels of noise exposure of any community around Logan Airport, continued its decline in the number of people exposed to levels greater than 65 DNL. This number has dropped 81 percent since reaching its peak in 1998. The number of residents

exposed to noise over 75 DNL increased from 2004 but still remained below 2001 levels.

The 2005 Cumulative Noise Index (CNI) of 153.2 Effective Perceived Noise Level (EPNdB) remained well below the cap of 156.5 EPNdB. The CNI decreased slightly compared to 2004 even with a slight increase in the number of operations in 2005. This decrease is primarily due to decreased use of recertified aircraft by cargo operators. Massport provided sound insulation for 471 residential dwelling units in 2005. Since the program's inception, Massport has sound insulated a total of 9,086 dwelling units. The majority of the units insulated in 2005 were in Winthrop.

The information in this chapter is very informative and I encourage Massport to continue with its updates in the 2006 EDR. I also strongly advise Massport to consider and address the numerous comments received that have raised noise related concerns in comments.

Air Quality

The Air Quality/Emissions Reduction chapter provides an overview of airport-related air quality issues in 2005 and efforts to reduce emissions. The 2005 emissions inventory results are driven by the small increase in aircraft operations at Logan Airport compared to 2004 levels. Compared to 2004 levels, total emissions of volatile organic compounds (VOCs) are estimated to have decreased by approximately 6 percent to 1,285 kilograms per day (kg/day). In 2005, total emissions of oxides of nitrogen (NOx) were estimated to be 4,187 kg/day, which is a 2 percent decrease from 2004 levels. Total emissions of carbon monoxide (CO) in 2005 were 9,556 kg/day, or 3 percent lower than 2004 levels.

For the first time, estimates of particulate matter emissions associated with Logan Airport are reported in this 2005 EDR in response to the recent availability of an FAA-approved method for computing particulate matter emission factors for aircraft. Total emissions of particulate matter (PM2.5) at Logan Airport in 2005 were approximately 83 kg/day [33 tons/year (tpy)]. NOx emissions at Logan Airport in 2005 were approximately 662 tpy lower than 1999 levels—a 28 percent decrease. It appears that there is an ongoing trend of decreasing nitrogen dioxide (NO2) concentrations at both the Massport and Massachusetts Department of Environmental Protection (MassDEP) monitoring sites located in the general vicinity of Logan Airport. In addition, annual NO2 concentrations at all monitoring locations were well below the NO2 air quality standards in 2005. The 2006 EDR should continue updates on the information presented in the 2005 EDR. **S-001-007**

Water Quality/Environmental Compliance

This chapter describes Massport's ongoing environmental management activities including NPDES compliance, stormwater, fuel spills, activities under the Massachusetts Contingency Plan, and tank management. Specifically, of the 97 spills reported in 2005, 15 (15 percent) were ten gallons or greater in quantity. Jet fuel spills accounted for 66 (68 percent) of the total spills, 12 of the jet fuel spills (18 percent) were ten gallons or greater in quantity. The remaining 31 spills involved gasoline, hydraulic oil, diesel fuel, and other substances. Of these spills, only

S-001-007

Chapter 7, Air Quality/Emissions Reduction of this *2006 EDR* contains updated air quality information for 2006.

three (10 percent) were ten gallons or greater. In 2005, only eight samples exceeded the regulatory limits. The North Outfall had two samples which exceeded the 15 milligrams per liter (mg/L) National Pollutant Discharge Elimination System (NPDES) limit for oil and grease, and the Porter Street Outfall had one sample exceed this limit. The North Outfall had two samples which exceeded the 0.3 milliliters per liter (ml/L) daily maximum limit for settable solids, and

S-001-008 the West Outfall had three samples exceed this limit. No other exceedances occurred. In accordance with the Massachusetts Contingency Plan (MCP), Massport should continue to report in the 2006 EDR how Massport will assess, remediate, and bring to regulatory closure areas of subsurface contamination.

Sustainability at Logan Airport

This chapter describes Massport's airport wide sustainability goals. In October 2000, the Massport Board approved an Authority-wide Environmental Management Policy, which articulates Massport's commitment to protect the environment and to implement sustainable design principles. In October 2004, the Massport Sustainability Team produced the *Massachusetts Port Authority Sustainability Plan* (Sustainability Plan). The Environmental Management Policy is incorporated in the Sustainability Plan as Massport's long-term sustainability goal or vision. This chapter describes Massport's continued efforts.

As I stated at the beginning of this Certificate, the 2006 EDR must provide responses to the

S-001-009 issues raised in comments received. The 2006 EDR must include a copy of this Certificate and a copy of each comment letter received on the 2005 EDR. In particular, Massport should provide a

S-001-010 thorough examination of issues raised regarding individual noise monitoring locations, noise measurement and modeling, and noise abatement. Massport should consult directly with individual commentors where necessary.

S-001-011 A distribution list for the 2006 EDR (indicating those receiving documents, CDs, or Notices of

S-001-012 Availability) should be provided in the document. This section must also include copies of all GEIR/Annual Update Certificates issued since 1995 to provide context for reviewers.

S-001-013 Supporting technical appendices should be provided as necessary.

February 15, 2007
Date

Ian A. Bowles

Comments Received:

01/30/07	State Representative Robert A. DeLeo
01/31/07	Joseph Felzani
02/05/07	Boston Transportation Department
02/06/07	Nancy Timmerman
02/07/07	Stephen Kaiser
02/13/07	City of Boston Environment Department

IAB/ACC/acc

S-001-008

Contaminated sites subject to the Massachusetts Contingency Plan (MCP) that still require further action are identified in *Chapter 8, Water Quality/Environmental Compliance and Management* of the *2006 EDR*. In 2005, two MCP sites, Terminal A (3-4829) and Pan Am Fuel Farm (3-4835), were brought to regulatory closure. Therefore there were only three MCP sites where further action was still being undertaken in 2006, and are reported on in this *2006 EDR*.

S-001-009

Appendix A, MEPA Certificate and Responses, of this *2006 EDR* includes the Secretary of Environmental Affairs Certificate on the *2005 EDR.* Other comment letters received on the *2005 EDR* are provided in *Appendix B, Comment Letters and Responses* of this *2006 EDR.*

S-001-010

Chapter 6, Noise Abatement and *Appendix H, Noise Abatement* examine the issues regarding individual noise monitoring locations, noise measurement and modeling, and noise abatement.

S-001-011

Appendix D, Distribution of this *2006 EDR* contains a distribution list which lists the recipients of the document or a CD containing the document. Notices of Availability are no longer sent, since everyone on the distribution list either receives a CD or a hard copy of the document.

S-001-012

Appendix A, MEPA Certificate and Responses of this *2006 EDR* contains copies of all Secretary of Environmental Affairs Certificates issued since 1995.

S-001-013

This *2006 EDR* contains technical appendices supporting the *Activity Levels, Regional Transportation Context, Ground Transportation, Noise Abatement, Air Quality/Emissions Reduction,* and *Water Quality/ Environmental Compliance and Management* chapters.

Copies of Secretary of Environmental Affairs Certificates issued for the Reporting Years 1995 through 2004

The Commonwealth of Massachusetts
Executive Office of Environmental Affairs
100 Cambridge Street, Boston, 02202

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October 2, 1996

CERTIFICATE OF THE SECRETARY OF ENVIRONMENTAL AFFAIRS
ON THE
GENERIC ENVIRONMENTAL IMPACT REPORT

PROJECT NAME	: Logan International Airport 1994/1995 Generic Environmental Impact Report
PROJECT LOCATION	: Boston/Winthrop
EOEA NUMBER	: 3247
PROJECT PROPONENT	: Massachusetts Port Authority (Massport)
DATE NOTICED IN MONITOR	: July 10, 1996

The Secretary of Environmental Affairs hereby determines that the Generic Environmental Impact Report (GEIR) submitted on the above project adequately and properly complies with the Massachusetts Environmental Policy Act (M.G.L. c. 30, ss. 61-62H) and with its implementing regulations (301 C.M.R. 11.00).

In general, the 1994/1995 GEIR is responsive to the Certificate establishing the scope for the document and presents a comprehensive, high-quality environmental analysis in a coherent, easy-to-read format. The GEIR contains detailed information on such issues as noise, air quality, ground access, water quality and community initiatives. The new section on intercity travel choices is particularly interesting and enlightening. I commend Massport for presenting such technically detailed and potentially arcane subject matter in a manner which allows for comprehension and meaningful response by technical agency staff and laypersons alike.

At the same time I concur with several commenters that the report leaves important issues unresolved, again, and should have been more responsive in certain aspects. The major issues of concern in this regard are the need to evaluate plans for Logan Airport in the context of regional intermodal transportation plans and options; and the need to maximize public transportation access to Logan Airport rather than accommodate single or low occupancy vehicles. Although the report provides much detail on these issues, it fails to demonstrate that the various agencies with responsibilities in these areas are in fact coordinating

effectively so as to make a difference in the planning and analysis for Logan Airport. This is a basic weakness in the report, which inevitably raises questions about the adequacy of proposed mitigation, and about overall priorities. The argument that Massport does not solely or ultimately control the outcome (i.e. its hands are tied by federal agencies and rules, or it cannot force other transportation agencies to step up to the plate) is no excuse; in fact, in the context of this review it only begs the question why such factors are not identified explicitly as obstacles -- which must be overcome. The same applies to other issues, such as mitigation of noise impacts.

The purpose of this review is not to defend the status quo; the plan to accommodate change, i.e. growth in air traffic, must be matched by whatever changes can be reasonably made to avoid an increase in already significant impacts. If that includes agency priorities and rules, and requires more effective interagency coordination, so be it. The next installment of this environmental review <u>must</u> document real changes in this regard, as explained in more detail below. Without such changes, it will simply not be possible to issue another finding of adequacy.

Purpose and History

The environmental review process at Logan Airport has been structured to occur on two levels: generic and project-specific. The GEIR has evolved from a largely retrospective status report on airport operations to a broader analysis which also provides a prospective assessment of long range plans. It has thus become (consistent with the objectives of 301 C.M.R. 11.14) part of Massport's long range planning. The GEIR now provides a "big picture" analysis of environmental impacts associated with current and anticipated (levels of) activities, and presents an overall mitigation strategy aimed at avoiding increases in such impacts. The generic analysis is supplemented by (and ultimately incorporates) the detailed analyses of project-specific EIRs.[1]

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[1] I once again disagree with claims that the review of Logan projects and impacts has been improperly segmented (see 301 C.M.R. 11.16). I still believe that the GEIR serves to provide the "big picture" analysis which prevents the individual components of Logan 2000 (and other projects) from proceeding in a planning vacuum or without due consideration of cumulative impacts. I realize, however, that with a "project" and review process of this magnitude and complexity, the risk of segmentation must be guarded against on an ongoing basis. I am also open to criticism (received

The GEIR is currently updated on a triennial basis, with Annual Updates filed in the years between GEIRs.

The scope of the GEIR has increased greatly since Massport's announcement of a major modernization program (first known as the Logan Airport Modernization Program or LAMP, and later reorganized and renamed Logan 2000). A previous version of the GEIR introduced the LAMP program in 1992, while the 1993 Annual Update presented the reorganization of LAMP into Logan 2000. The current version of the GEIR maintains the basic outline of the Logan 2000 program, although it also includes discussion of the Airside Improvements project, which has advanced into the public review process since the time of the 1993 Annual Update. Since the last GEIR, the MEPA process has been completed for several individual components of Logan 2000, including the West Garage, Fuel Distribution System, Fuel Storage Facility, and Replacement Hotel. Project-specific EIRs are pending for the International Gateway, People Mover, and Airside Improvements projects.

1995 Certificate

On September 28, 1995, I issued a Certificate establishing the scope for the 1994/1995 GEIR. This Certificate, along with the general guidance contained in 301 C.M.R. 11.07 and 11.14, forms the basis for the GEIR document. The Certificate addressed various procedural issues; required analysis of the Airside Improvements in the GEIR context; and required analysis of inter- and intra-regional transportation issues and environmental impacts (ground transportation, air quality, noise, and water quality). The scope also required several "special studies" of existing public health data, odor impacts, soot impacts, low frequency noise, and environmental mitigation at other airports. In addition, a separate Certificate issued in June 1996 required

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frequently) and concrete suggestions (received less frequently) on how the review process can be improved. I will request Massport to dedicate one of its public workshops to this subject and direct the MEPA Unit to work with Massport staff to organize this event within the next few months.

I urge the federal agencies, in particular the Federal Aviation Administration (FAA) and the Environmental Protection Agency (EPA) to participate. As is indicated in several sections of this Certificate, these agencies play a major role in "setting the rules" and should be part of any major discussion of how the analysis, and the review process, can be improved.

that the GEIR include a preliminary analysis of the environmental consequences of the so-called "first hour free" parking policy announced in May 1996.

I have generally organized this Certificate to respond to issues raised in the order in which they were presented in the GEIR, although I have for the most part integrated discussion of the "special studies" into the discussion of the environmental impact analyses.

Environmental Policy and Planning

Statement of Policy

The GEIR includes a general environmental policy statement intended to serve as a guide for managing impacts at Logan Airport. Massport is committed to "...reduce or minimize, wherever practical, the environmental impacts of the operation of Logan Airport as annual passenger volumes rise in the future" (GEIR, p.I-2-3). The phrase "wherever practical" could be read as a weakening of Massport's previous mitigation commitments. Apparently, it does not reflect a change in commitment but rather a concern that some of the major issues cannot be resolved by Massport but require approval or other action by other agencies. Although I appreciate the difficulty Massport may face in getting the necessary cooperation from others, I do not believe it should make any difference in identifying impacts and the most effective means to avoid, minimize or mitigate them.

Massport has also articulated broad (although a bit more specific) policy statements for noise, ground access, air quality, water quality, and community support. Some of these broad goals raise important questions, which I will address in more detail in the relevant sections below.

Regional and Intermodal Transportation Issues

The GEIR analyzes Logan's role in the regional transportation system and concludes that Logan will maintain a dominant position in New England air transportation, while auto travel will maintain a dominant position as the mode of choice for travel to most destinations within the northeast (although the addition of high speed rail service between Boston and New York will lead to rail displacing air service as the common carrier of choice between the two cities). By the GEIR's estimate, the availability of high speed rail could lead to diversion of about 3% of total Logan passengers at the 37.5 million passenger level.

The GEIR analyzes the potential for passenger diversions from Logan to other regional airports and to high speed rail. Manchester airport is losing 75% of its potential market to Logan, while Worcester airport is losing 91%. The GEIR estimates that 1.2 million annual air passengers can be diverted to Manchester, with another 900,000 annual diverted to Worcester, Providence, and Portland combined, for a total of 2.1 million annual passenger diversions to other airports. (Logan currently attracts about 5 million air passengers annually from origin points that lie within a market area for a regional airport. The GEIR estimates (but does not explain why) approximately 40% of these passengers could reasonably be diverted to the regional facilities.)

The analysis of regional airports and intermodal options raises questions that need follow-up. Massport concludes that increased use of regional airports and rail will not "...offer meaningful traffic relief to Logan Airport" (p. I-5-28). Many commenters have taken exception with this conclusion. Massport is correct in asserting that the potential diversion (which Massport implicitly estimates at roughly 3 million passengers per year[2]) is relatively small compared to the predicted passenger volumes at Logan in 2010. However, Massport has committed to minimizing impacts "wherever practical," and I agree with the numerous commenters who point out that 3 million annual passengers (and potentially many more) is hardly a trivial number, and represents potentially significant mitigation. The next Annual Update should reexamine the issue of passenger diversions. Massport should detail what steps it (and/or other agencies) can take to realize passenger diversions to the other airports and to high speed rail, better justify the potential diversion estimates, and reconsider its forecasts of passenger levels accordingly.

I note that such an analysis was required for this GEIR. Massport has responded with an extensive discussion of intermodal transportation which shows that Massport is taking this issue seriously and which begins to address the concerns. It still

[2]This estimate results in part from using Amtrak's estimated rail ridership numbers (EOEA #9134). Several comments have argued that Amtrak's figures underestimate the likely ridership, so diversions to rail could possibly prove higher than predicted. In addition, the analysis does not assume any increased diversions to rail as a result of the proposed North Station-South Station rail link. The latter omission represents a potentially significant source of error in the total diversion estimate.

defers to other agencies, however, for any real initiative to be taken. As a result, the discussion does not really seem to affect the overall strategy or analysis. This approach is no longer acceptable, given that this issue has repeatedly been identified as critical to the most basic planning assumptions for Logan Airport, and possibly to the question of what the most effective way is to minimize impacts on the environment and nearby communities. Nor can the necessary shift in approach wait until the next version of the GEIR. The next Annual Update must present a concrete plan, developed by Massport and other agencies, in particular Massport's sister agencies in the Executive Office of Transportation and Construction (EOTC), aimed at distributing regional transportation demand in the most effective, including least environmentally damaging, ways (for example, to maximize diversions to other airports and high-speed rail unless such diversions can be shown to cause greater adverse impacts). Without such a plan, the Annual Update will not be adequate.

Interagency Coordination

Any meaningful discussion of intermodal and interregional transportation requires considerable coordination with other transportation agencies. Massport, as part of EOTC, participates in an intermodal transportation working group devoted to precisely these issues. I urge Massport and the other group members to make the regional transportation analysis for Logan Airport a high priority. (The same analysis will be needed for other airports where increased operations and significant impacts are anticipated.) Specifically, I request that the group analyze data on regional (and interregional) transportation demand, the prospects for intermodal transportation improvements, and the feasibility of actually diverting demand from Logan to high speed rail, including the regional effect of the North-South Rail Link and also considering improvements that can be made in connections to local transit. (Clearly, this analysis should dovetail with the other interagency effort that is needed to improve local public transportation access to Logan; see below under Ground Transportation.) The next Annual Update should report on these discussions, evaluate how they affect planning and operations at Logan and present concrete proposals.

The GEIR makes a valid point (p. I-5-35) in reminding reviewers that increased use of other airports can lead to significant environmental impacts at and around those airports (for example, New Bedford). The comments by the Department of Environmental Protection (and others) have suggested the benefits of a broader

analysis of overall airport demand and capacity in the Commonwealth, for the purpose of minimizing cumulative impacts from airport development while searching for an optimal balance between reliance on Logan Airport and development of alternatives. I agree that this idea has merit and should be useful for planning purposes to the transportation agencies themselves. It is my understanding that the Massachusetts Aeronautical Commission (MAC) has undertaken a market analysis which analyzes precisely these issues from an avaiation and economic perspective. Integrating environmental issues into this study and inviting public participation could produce substantial benefits for both environmental and transportation agencies. I will follow up with EOTC and with MAC on this matter, and ask staff from the environmental agencies to be available for assistance.

Environmental Studies

Airport Operations

The GEIR reports that jet aircraft operations, which have remained fairly stable since 1986, are expected to grow in both absolute number and as a percentage of total operations by 2010. Commuter aircraft operations are predicted to experience small growth in absolute number, but a decline as a proportion of total operations. General aviation operations are predicted to remain essentially unchanged in absolute number, and decline in proportion to other operations. These trends could mean that airport operations will become relatively more efficient in time, which could have implications for (among other things) the noise analysis and for the Airside Improvements. I expect that the upcoming Airside EIR/EIS will investigate this issue in more detail.

Recent trends also indicate (and the GEIR admits) that the long-standing assumptions about passenger forecasts in 2010 may prove highly conservative. While I appreciate the benefits of a conservative analysis, I caution Massport to keep its passenger forecasts realistic, lest projects (and hence impacts) be proposed unnecessarily. Many of the Logan 2000 projects which have undergone MEPA review so far have responded to existing deficiencies as well as future demand projections. Massport should ensure that other projects for which MEPA review is anticipated or underway (such as the Airside projects) be evaluated in these terms. I request that the Airside Draft EIR in particular include a "sensitivity analysis" using a lower passenger forecast than 37.5 million passengers, to determine if

the Airside projects still make sense if planning assumptions regarding passenger demand are revised downward.

Noise

Judging from the comments, noise remains one of the most critical (and criticized) impacts of Logan Airport. The GEIR includes a wealth of information on noise impacts, including a much anticipated study of low frequency noise and analysis of flight tracks. The analysis has raised many important questions in need of follow-up.

The noise abatement policy commits Massport to maintenance of the Cumulative Noise Index (CNI) cap at 156.5 effective perceived decibels (EPNdB), and the GEIR predicts that Massport will be able to meet this goal through 2010, in both the 37.5 and 45 million annual passenger scenarios. The noise abatement policy also commits Massport to "...minimizing nighttime noise and to addressing and responding to noise issues and complaints" (p. I-2-3). However, the GEIR does not offer specifics on how Massport intends to limit nighttime noise. In the short term, conversion of the fleet to Stage 3 will serve to reduce nighttime noise, but over the long term, this positive trend should reverse due to the increased volume of nighttime Stage 3 flights as overall activity levels continue to increase.

Massport and the Federal Aviation Administration (FAA) should begin to deal with this concern now. I realize that it raises fundamental and difficult to resolve issues about aviation policies and rules, and that it will not be easy to develop additional mitigation. Given the significance of this impact area, that is all the more reason to begin this discussion now and to report on it in the next Annual Update and the Airside Draft EIR. I note that the Airside EIR will also be a Federal Environmental Impact Statement (EIS) and expect that FAA and EPA will address this issue in light of the National Environmental Policy Act (NEPA).

Massport has adjusted the inputs to the Integrated Noise Model (INM). As a result, the INM better reflects measured noise levels at the noise monitoring sites (the old INM averaged an underestimate of 4.2 dB, while the new model underestimates by an average of 2.2 dB). However, given the large number of people who live just outside the 65 dBA DNL contour for soundproofing eligibility, I remain concerned that many residences modelled as exposed to noise less than 65 dBA DNL may actually experience noise impacts greater than 65 dBA DNL, and would thus qualify for

residential soundproofing if the INM were completely accurate. Massport should perform a "sensitivity analysis" to determine the extent of this possible problem with the INM and soundproofing programs, and report back in the next Annual Update.

The next Annual Update should also include (preferably in an appendix) the technical basis of the INM, describe the strengths and weaknesses of the model, and propose any feasible means of increasing the model's accuracy.

The GEIR includes a noise contour for 60 dBA DNL. This has proven helpful in understanding the extent of noise impacts, and also in highlighting possible shortcomings in the current emphasis on 65 dBA DNL contours. Future GEIRs and the Airside EIRs should include this additional contour.

The GEIR includes an analysis of flight tracks, and shows that some aircraft types (and some carriers) are much better than others in abiding by the established noise abatement procedures. However, the analysis does not explain why this is the case. The next Annual Update should present more discussion on causes of variation in flight tracks. Massport proposes to monitor flight tracks on an ongoing basis. The next Annual Update should include at least a summary of any additional flight track analyses undertaken between now and the printing date, and discuss any implications for noise impact analysis and mitigation.

The noise appendix includes the analysis of low-frequency noise impacts in areas close to the airport. The study finds that Stage 3 aircraft exhibit modest improvements compared to Stage 2 when considering low frequency noise (the improvement is much less pronounced than at higher frequencies). The study also finds that Stage 3 noise emissions are comparable to (and in a few cases slightly higher than) Stage 2 noise emissions at points along runway sidelines during departures and landings. On average, the effect of the fleet conversion to Stage 3 will be to slightly decrease low frequency noise in areas around the airport. The analysis also concludes that the residential sound insulation program can be expected to mitigate low frequency noise in areas near the airport (although the mitigative effect of sound insulation will not prove as great as at higher frequencies, because low frequency noise passes through solid structures much more easily than does high frequency noise).

The low frequency analysis does not make it clear whether all areas subject to significant low frequency noise impacts are in

fact eligible for soundproofing, although from the GEIR and the comments it would appear that this is not the case. The next Annual Update should discuss this issue further. I ask that Massport work with appropriate state and federal agencies to define standards for measuring low frequency noise impacts and determine reasonable mitigation eligibility criteria. Currently (through no fault of Massport), there are no standards to quantify what constitutes an unacceptable level of low frequency noise. However, the absence of standards does not justify inaction with respect to mitigating what the GEIR and commenters agree is a measurable (and potentially significant) impact.

The GEIR mentions a growing trend toward retrofitting Stage 2 planes to meet the quieter Stage 3 specifications, rather than purchasing newer, quieter planes in the first place. Retrofitted (or "hush-kitted") Stage 2 planes tend to produce significantly more noise than new Stage 3 planes (although significantly less noise than non-hush-kitted Stage 2 planes). Massport notes that this practice could lead to a gradual long term decline in noise levels, even after the phase-out of Stage 2 aircraft, as the hush-kitted aircraft are gradually replaced by quieter-still new Stage 3 aircraft. However, this practice also means that the full mitigative potential of Stage 3 may be deferred. The next Annual Update should address what steps Massport, and others, can take to encourage new Stage 3, as opposed to hush-kitted Stage 2, and whether the Noise Rules offer any leverage in converting to new Stage 3 as opposed to hush-kitted Stage 2.

Discussion at the MEPA consultation sessions and technical workshops has revealed a need for basic information concerning the health impacts of ambient noise. I request that Massport conduct a literature search on the topic, and include a summary of the technical literature and references for additional reading in the next Annual Update.

<u>Ground Access</u>

Despite an 18 percent increase in annual passengers over the past decade, average annual traffic at the airport has increased less than 2 percent over the same period. Massport deserves credit for holding traffic growth well under passenger growth. The ground access section explains some major successes, but also points out obvious areas for improvement and leaves some questions about long-term traffic demand management unresolved.

The centerpiece of Massport's ground access policy is a commitment to increase High Occupancy Vehicle (HOV) modes of

access to the airport to 35.2% by the time passenger volumes reach 37.5 million annually (anticipated in 2010). The preliminary data for 1996 reported in the GEIR estimates HOV mode share already at 31.4%. If current trends continue, the goal of 35.2% HOV use will be reached well ahead of schedule. Logan Express has been a resounding success. Private HOV services and water transit are also expanding. With the formation of the Logan Transportation Management Association (TMA), new opportunities exist for reductions in employee trips to the airport, leading to further progress in ground access mitigation.

However, the ground access data also raise numerous questions. With the long term HOV goal in sight, the question naturally arises as to whether a more ambitious HOV percentage is attainable (as it appears to be) and appropriate.[3] Massport should seriously consider revising the target percentage upward.

The HOV increases are coming about despite an MBTA mode share which is flat. The redesign of Airport Station and construction of the People Mover should help make the Airport MBTA station more passenger-friendly, but these plans do not address obstacles to airline passenger transport which exist along other transit lines (e.g., multiple transfers needed to get to the airport) or other points along the Blue Line (e.g., accommodations for luggage), nor do they evaluate the potential benefits from proposed transit projects like the Urban Ring. The MBTA ridership data point to a serious need for close coordination between Massport and the MBTA to further environmental goals for the airport. (Massport touts Logan's location near transit as one of its advantages over regional airports, so it is especially important that this advantage be exploited.)

As I have stated repeatedly in the past, this coordination must go considerably beyond the interface of projects at particular points (such as the Airport Station) to include truly coordinated planning to improve access and reduce impacts from other ground

[3] I note the point made by several commenters that 64.8% non-HOV use at 37.5 million annual passengers (i.e. the current long-term goal) equates to a large increase in non-HOV trips compared to 71.5% non-HOV use at 24.1 million annual passengers (i.e. the levels reported in 1995). This could represent an impact for which feasible mitigation exists - namely, increasing the target HOV percentage. At the same time, I recognize that the opening of the Ted Williams Tunnel to general traffic will create new challenges (as well as opportunities) for meeting Massport's HOV goals.

transportation modes. As with the need for coordinated regional transportation planning, I recognize that Massport is not solely responsible for this part of the analysis, but also find that the analysis no longer can be considered adequate without this element fully developed (i.e. problems and opportunities for improvement identified and a concrete action plan presented in the next Annual Update).

One critical question which remains unresolved in the GEIR is the impact of the "first hour free" parking policy implemented in May 1996, which reversed a long-standing practice to charge airport patrons for access to airport parking facilities during the first hour of a trip to the airport. "First hour free" was the subject of a Certificate issued in June 1996, which required further analysis of the policy and required Massport to report preliminary findings in the GEIR. The preliminary findings indicate that during the first month of first hour free, approximately 880 vehicle trips per day at the airport boundary were attributable to implementation of the policy. Approximately 9 percent of all first hour exits from the garages occurred because patrons had been enticed to drive by the free parking policy. The preliminary analysis concludes that first hour free has lead to a 1% increase in average daily traffic. While this level of traffic increase does not fatally compromise previous ground access assumptions, it is still too early to ascertain what the long term impacts of the policy will prove to be (and it is clear that the policy has lead to an increase in reliance on automobiles). The issue clearly requires follow-up in the next Annual Update. I also reminding Massport of the requirements of the outstanding Certificate guiding the study. I request Massport to incorporate the detailed study of first hour free into the next Annual Update.

The preliminary analysis also describes the practice of some drivers (how many is unclear) to leave the Central Garage and reenter multiple times (thus circling the airport hourly) to avoid incurring a parking fee. This practice defeats the stated purpose of first hour free, and requires attention in the follow-up report. The follow-up report should also quantify any impacts on Vehicle Trip Per Passenger Rates (which are finally showing improvement after a period of stagnation)[4] and Parking Demand

[4] The GEIR does not include detailed information on vehicle trips per passenger rates for future years, nor explain why this information is not included. The next Annual Update should include such information.

(which shows a beneficial trend toward long term parking at the expense of short term parking).

Assuming continued success in the efforts to shift to long-term parking, Massport will eventually have to entice some parkers into other modes, to ensure that the parking supply (which is capped by the Logan Parking Freeze) remains adequate. Massport is proposing an advertising campaign to shift parkers to other modes when the parking supply becomes sufficiently tight. Massport already undertakes such an advertising campaign on a smaller scale now, especially around peak travel periods such as the day before Thanksgiving. The current program appears successful in encouraging alternatives modes of access to the airport. Massport should expand the advertising program now, rather than wait for a parking "crisis" at an unspecified date. The program should have ground access and air quality benefits, and appears to be practical mitigation for documented impacts. The next Annual Update should elaborate.

Many comments on the proposed scope expressed concern over the location of "remote" employee parking facilities in Chelsea, just outside the boundaries of the Logan and East Boston Parking Freeze Districts, and whether this location actually undermined the benefits of the parking freeze. The GEIR includes an analysis of the environmental impacts of employee parking in Chelsea, and demonstrates convincingly that the current location and number of employee parking spaces in Chelsea produces a small but measurable net environmental benefit. The study does not determine whether Chelsea is the optimal location for existing or additional employee parking, so this issue is not completely resolved, but the information in the GEIR does help resolve the long-standing and potentially serious questions as to whether parking facilities in Chelsea are environmentally beneficial and/or consistent with the intent of the Parking Freeze.

The GEIR also analyzes the feasibility of a shuttle for airport employees who reside in East Boston, and concludes that such a service would produce net reductions in Vehicle Miles Travelled. The GEIR commits Massport to exploring these opportunities further. Since the publication of the GEIR, Massport has secured funding for such a shuttle service, and is now working on implementing a shuttle program.

Air Quality

Massport's broad air quality goals (p. I-2-4) include managing ground access to the airport to control pollutant emissions;

working to convert the Massport service vehicle fleet to cleaner fuels; encouraging other airport tenants to convert to cleaner fuels; and working with the FAA to encourage cleaner aircraft engines. The GEIR demonstrates that emission burdens have been generally declining over the past several years, but these trends are projected to eventually reverse, based on a conservative analysis presented. The air quality discussion raises the broad question of how much control Massport has to effect changes in tenants' service fleets, and also raises questions about current regulatory controls.

Emissions of volatile organic compounds (VOC) and carbon monoxide (CO) both show reductions through the mid-1990's, followed by rather steep increases to 2010. Massport has presented this analysis as a true worst case scenario, as it assumes no further improvements in emission control technology and no further movement towards conversion of the service vehicle fleet to cleaner fuels. (The GEIR mentions that technological improvements may lower these emissions, but does not elaborate on what those technological improvements may be.)

As a result of these assumptions, service vehicles emerge as the major source of VOC and CO pollution in 2010 (accounting for 59% of total CO emissions from all airport sources). Clearly, reducing emissions from service vehicles can produce substantial air quality benefits. Mitigation of this impact should be a high priority. Massport claims that it can only "encourage" tenants to convert service vehicles to cleaner fuels. Many commenters disagree, and I am not convinced either. Massport has considerable leverage with tenants, and I urge Massport to exercise that leverage and effect an expeditious conversion of the service fleet to cleaner vehicles. The next Annual Update should follow up on this issue, and quantify the air quality benefits of an aggressive conversion program.[5]

The GEIR compares emissions from Massport shuttle buses from Chelsea running on diesel fuel vs. compressed natural gas (CNG), and demonstrates clear air quality benefits with CNG buses. The East Boston community has expressed concerns with air quality emissions (particularly diesel fumes) from Massport shuttle buses on East Boston streets. The next Annual Update should discuss the feasibility of converting these shuttle buses to CNG or other cleaner fuels.

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[5] I realize that Massport should not be held solely responsible for emission reductions in the service fleet, and that the current regulatory climate plays a substantial role in emission rates from service vehicles. In this regard, the role of EPA will prove critical. I understand that EPA is in the process of phasing in emission standards for "non-road" engines. The next Annual Update should discuss the effects of the new standards on service vehicle emissions.

Emissions of oxides of nitrogen (NO_x) are projected to increase steadily through 2010, largely as a function of increased aircraft operations. The State Implementation Plan accounts for the projected increases in NO_x through 2010. Nonetheless, GEIRs and/or Annual Updates should continue to report on projected emissions burdens, and Massport should continue to report on technological improvements and any implications for emission levels. In addition, Massport should take any feasible measures within its power to reduce these emissions.

Particulate emissions are reemerging as a major air quality (and public health) concern. I anticipate that EPA will promulgate an updated standard for large particulate matter (PM_{10}) and a new standard for small particulate matter ($PM_{2.5}$) in the near future. I therefore expect that the next Annual Update will report on how the new standards will affect Massport's air quality goals. Massport should also develop an appropriate monitoring program (including monitoring sites in nearby neighborhoods) for particulate emissions. The next Annual Update should report on progress in development of such a program. I encourage consultation with the Department of Environmental Protection on this issue.

The GEIR includes an analysis of odor impacts. The odor study finds correlations between odor complaints and hour of the day, runway use, aircraft operations, wind direction, and outside temperature. The study also concludes that odor impacts are a problem for communities close to the airport, especially in the Court Road, Orient Heights and Pleasant Street neighborhoods. Massport commits to continued monitoring of odor complaints and conducting research which can "...support development of mitigation measures to abate odor impacts" (p.II-4-51). However, the GEIR does not actually propose mitigation for the impact. The next Annual Update should report on any new trends in odor complaints and should discuss the feasibility of possible mitigation measures.

Massport is currently preparing a study of soot deposits in neighborhoods near the airport, in response to concerns expressed by residents. This study will attempt to determine a possible point of origin, and whether the airport is responsible. The origin of sooty deposits near airports has remained unclear from previous studies at other airports. Massport has developed a new approach to studying this problem, which holds out some promise of at last arriving at answers. Massport will be meeting with community groups and consultants in the coming months to refine the scope of study and focus on mitigation potential. The next

Annual Update should include this study, including any recommendations and possible mitigation measures.

Air Quality/ Public Health

The GEIR scope required Massport to examine available health data for the area around the airport and to determine what conclusions might arise from such an analysis. The results of the statistical analysis show that East Boston overall does not experience statistically poor public health compared to Boston as a whole. Of the fifteen leading causes of morbidity (illness) in Boston, East Boston showed statistically significantly elevated level for one (Cholecystectomy with disease, which includes colon ailments). With respect to the fifteen leading causes of mortality, East Boston showed no statistically significant differences at all compared to Boston as a whole.

The GEIR also includes statistical analysis of the cancer registry data. Boston as a whole reported significantly elevated rates of cancers of the oral cavity/pharynx, esophagus, larynx, and bronchi/lungs, although other nearby communities (Revere, Winthrop, and Chelsea) did not show consistent patterns. (Data for East Boston as a neighborhood are not available.) The data are subject to a number of limitations, including patient mobility and accuracy of reporting. Based on the observed data, the analysis proved inconclusive.

The health agencies have pointed out limitations in the data analysis methodology required by the scope, and have raised concerns that the relatively optimistic conclusions of the analysis do not necessarily present a complete picture, because categories of health outcome are lumped together (for example, the heading "malignant neoplasm" includes over one hundred different types of cancer), and these categories are not presented in relation to specific components of air pollution.

The issue of public health remains clearly relevant to any discussion of air quality. Absent evidence of a direct correlation between Logan airport and community health problems, I believe the public health interests of the East Boston community are best served by a focus on what Massport can do to document - and ultimately mitigate - air quality impacts from Logan Airport. In addition, I believe it should be up to the public health agencies to follow up on data collected by Massport and others. I urge Massport to continue its discussions and cooperation with these agencies and to report on the results, as well as respond to their comments, in the next Annual Update.

It is my understanding that Boston Edison Company is sponsoring a study of air quality and public health issues in South Boston, and is soliciting input from various agencies and groups. Massport should consider an appropriate level of participation in this study.

Water Quality

The GEIR reports general compliance with the airport's National Pollutant Discharge Elimination System permits, with the trend over the past few years heading towards near 100% compliance.

The issue of formal protection for Wood Island Bay Marsh (above and beyond the protection afforded by the Wetlands Protection Act) remains open. Massport holds out the possibility of a land transfer or conservation restriction on this important open space. Various comments from environmental agencies and groups have expressed an interest in formally protecting the marsh. I encourage Massport to consult with relevant parties (including the Department of Environmental Protection, Metropolitan District Commission, Boston Conservation Commission, and Boston Natural Areas Fund) over the most appropriate management of and protection for the marsh. Massport should include the results of these discussions in the next Annual Update.

Massport reports a preliminary conclusion that de-icing and anti-icing fluid seeping into groundwater is the cause of the odor problems reported at the Williams Tunnel. However, the conclusion is tentative, and a joint Massport/ Massachusetts Highway Department investigation should provide more conclusive information. The next Annual Update should report on whether the investigation has supported any definitive conclusions, and whether the problem has any implications for groundwater quality.

The odor problems in the tunnel have served to renew focus on de-icing and anti-icing practices. Several comments have requested that Massport investigate a de-icing fluid recycling system. The GEIR mentions that Denver International Airport has installed such a system, but the GEIR does not discuss the applicability of this system to Logan, or its feasibility. Massport should analyze this issue in more detail and report back in the next Annual Update.

A commenter at the first GEIR consultation session expressed concern with floating debris in Jeffries Cove and stranded debris on the riprap adjacent to the harborwalk at Jeffries Cove. The next Annual Update should discuss Massport's program for airport

perimeter debris removal, and investigate whether more frequent debris removal operations are warranted. I encourage consultation with the Boston Conservation Commission on this issue.

Community Support

This new section of the GEIR on Massport's community support activities generated both favorable comments and some concerns at the GEIR consultation sessions. The foremost concerns involve the public participation process for the development of the airport edge park system. The next Annual Update should provide more information on the opportunities for community input into park development and design. Massport should aim to involve the surrounding communities at early stages of park development.

Environmental Initiatives at Other Airports

This appendix lists many interesting mitigation programs proposed or operational at other airports around the world (Denver's de-icing recycling is mentioned above). However, the GEIR does not discuss the applicability of the various mitigation measures to Logan, or what the measured benefits have been at other airports. At least some of the mitigation measures appear feasible at Logan Airport, as pointed out by the Community Advisory Committee. The next Annual Update should analyze the initiatives listed, and should discuss their feasibility at Logan. For mitigation found feasible, the Annual Update should offer at least a rudimentary analysis of what the expected mitigation benefits might be for Logan.

Mitigation

Several commenters have raised concerns that certain mitigation measures previously committed to were not included in this GEIR (notably commitments related to ground access). Massport has opted to include discussion of mitigation goals within each chapter of the Environmental Studies volume, without producing a separate section on mitigation commitments. As a result, the reader must cobble together numerous sections of the GEIR to arrive at an overall picture of Massport's mitigation strategy, and it is difficult to determine how the set of mitigation commitments in this GEIR differs from commitments made in previous GEIRs or project-specific EIRs.

The next Annual Update should include a formal mitigation summary, in either tabular or narrative form. The summary should

include a brief description of all environmental mitigation commitments, and should include approximate timetables for implementation. The summary should indicate the origin of the mitigation (i.e. whether the commitment grew out of the GEIR, a project-specific EIR, a section 61 finding, or a separate agreement with the community). The mitigation summary should also explain any changes to the mitigation program between the previous GEIR and this GEIR (and the next Annual Update), and what the implications of those changes are for Massport's ability to meet its overall mitigation goals.

Procedural Issues

Massport has asked that I reconsider the requirement that all new air services by new airlines at Logan be subjected to individual MEPA review. I think this request has merit. Existing large airlines which predate the current version of the MEPA regulations can add flights without MEPA review, while any new airline must file an Environmental Notification Form (ENF), and any airline which has filed an ENF must file a Notice of Project Change for every scheduling change, regardless of the number of flights to be added. The information gathered in the ENF review varies very little and the most useful information is not even contained within the ENF, but rather in Massport's audits. The impacts are usually very similar from one ENF to another, and the mitigation proposed invariably includes examination of Stage 3 aircraft use, encouragement to join the Logan TMA, and encouragement to promote public transportation to and from the terminal. Comments on new airline ENFs also vary little from project to project. In short, the review of new airline entrants at Logan does not appear to contribute much in substantive terms.

The MEPA regulations at 301 C.M.R. 11.14 (2) state that "...once a generic EIR on a program or policy has completed review under these regulations, individual proponent applications for the subject permits or financial assistance shall not require the filing of an ENF." I believe it makes sense to incorporate the impact analysis and mitigation commitments for new airline entrants directly into the GEIR process, rather than having each new airline submit an ENF. I therefore propose to develop a Memorandum of Agreement (MOA) between the Executive Office of Environmental Affairs and Massport which will commit Massport to require (where possible) and encourage (where necessary) specific mitigation measures for each new airline entrant, and which will eliminate the need for the filing of ENFs. I will publish the draft MOA in the <u>Environmental Monitor</u> for a twenty day public comment period, after which I shall integrate public comments as

appropriate and finalize the MOA. The MOA will apply only to Logan Airport - new airline entrants at other airports would continue to submit ENFs. Until the MOA is finalized, the current procedures will remain in effect.

In the Certificate which established the scope for the GEIR, I promised to rule on Massport's request that the GEIR be submitted every three to five years, as opposed to the current three year schedule. I have carefully considered this request, and recognize that the GEIR imposes a substantial reporting burden on Massport. However, with individual Logan 2000 projects and the Airside Improvements currently going through MEPA review, it makes sense to publish a GEIR relatively frequently to report on progress, recheck analyses and assumptions, and investigate whether any unforeseen cumulative impacts have arisen. Also, weaknesses in the analysis provided to date clearly need to be remedied in the next GEIR, not just the next Annual Update.

The GEIR and most project-specific EIRs have long used 1999 as a future conditions year for purposes of environmental analysis. That future condition is now just a few years away. It makes sense to require that the next GEIR check the long-standing assumptions about the state of the airport in 1999 with actual data from 1999. This will allow the next GEIR to revise predictions and fine-tune the mitigation strategy with a solid empirical foundation. I therefore require that Massport file a GEIR in calendar year 2000, which would cover operations through 1999 (although it could also include preliminary analysis of 2000 data as appropriate) After that date, and assuming that Logan 2000 is implemented roughly on schedule, I believe that a GEIR in three to five year intervals (with prior consultation between EOEA and Massport on the exact timing) is appropriate.

In preparing this GEIR, Massport circulated a Proposed Scope for public comment before the Secretary issued a binding scope. I believe this approach served to maximize public input into the scoping process and clearly highlight salient issues early in the review process. I request that Massport file an updated Proposed Scope in calendar year 1999 (perhaps with the Annual Update for that year) to begin anew the process of public input into the scoping of the Logan GEIR.

Massport should submit the next Annual Update (analyzing conditions through 1996) no later than August 31, 1997. I recognize that this Certificate requires the inclusion of considerable follow-up in that document. However, GEIRs invariably raise important issues which require follow-up sooner

rather than later, and this GEIR is no exception. I anticipate that the Annual Update in a year following the publication of a GEIR will always have to include such analytical follow-up to the GEIR and respond to comments on the GEIR. Other Annual Updates should provide more of a "snapshot" of the previous year's operations and impacts, with more substantial analysis awaiting the next GEIR. Annual Updates in years other than the year immediately following publication of a GEIR should therefore be considerably less voluminous and Massport should submit these documents by July 31 of the year following the subject year.

Comments

The next Annual Update should include a Response to Comments section which addresses the comments listed at the end of this Certificate.[6] The Response to Comments section included in this GEIR is well constructed and cross-referenced (although several comments have complained of general responses or document references in response to specific questions). Massport may follow the same format in addressing comments in the next Annual Update, although the Response to Comments section should pay particular attention to increased specificity where necessary.

I note that several comments on this GEIR were submitted after the close of the extended public comment period. Although I appreciate their thoughtfulness, the late submittal made it difficult to prepare this Certificate by the deadline imposed on me. Since I prefer to take all comments into consideration, I urge commenters to adhere to the comment deadline. I cannot guarantee that late comments will be considered in the future.

10/2/96
Date

Trudy Coxe

[6] I reserve the right to require Massport to respond in the next Annual Update to comments submitted on project-specific EIRs submitted between now and the printing of the next Annual Update, if those comments prove generic in nature.

Comments received :

8/5/96	Community Working Group (CWG) (Tillinghast Licht & Semonoff: N. Glick)
9/4/96	CWG (Tillinghast Licht & Semonoff: N. Glick)
9/5/96	CWG (Tillinghast Licht & Semonoff: N. Glick)
9/5/96	Winthrop Noise, Air Pollution and Airport Hazards Committee (G. Falbo)
9/6/96	CWG (Tillinghast Licht & Semonoff: N. Glick) (to Massport)
9/10/96	CWG (Tillinghast Licht & Semonoff: N. Glick)
9/12/96	City of Revere (F. Stringi)
9/17/96	CWG (Tillinghast Licht & Semonoff: N. Glick)
9/23/96	The Boston Harbor Association (V. Li and J. LeBlanc)
9/23/96	Boston Public Health Commission (L. Shirley)
9/24/96	Association for Public Transportation (B. Andelman)
9/24/96	Keith Davison
9/24/96	Frederick Salvucci
9/24/96	Executive Office of Health and Human Services, Department of Public Health (S. Condon)
9/24/96	Massachusetts Audubon Society (E. Roddis)
9/24/96	North South Rail Link Citizens Advisory Committee (R. O'Brien and H. Evans)
9/24/96	Winthrop Noise, Air Pollution and Airport Hazards Committee (G. Falbo)
9/24/96	Department of Environmental Protection (S. Lipman)
9/24/96	Boston Natural Areas Fund (V. Burns)
9/24/96	Town of Milton Airplane Noise Committee (Murphy, Hesse, Toomey, and Lehane: J. Flynn and K. McCarthy)
9/24/96	Boston Redevelopment Authority (R. Mertens)
9/25/96	Community Advisory Committee to Massport (B. Mader)
9/25/96	Councillor Diane Modica
9/25/96	AIR, Inc (McGowan, Engel, Tucker, Garrett & Schultz: P. Koff)
9/25/96	City of Boston Environment Department (L. Downey)
9/25/96	Save the Harbor Save the Bay (J. Sugerman)
9/26/96	Conservation Law Foundation (S. Pollack)
9/26/96	Joseph Felzani
9/26/96	U. S. Environmental Protection Agency (J. DeVillars)
9/27/96	Robert and Lynn Mazzarella

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December 1, 1997

CERTIFICATE OF THE SECRETARY OF ENVIRONMENTAL AFFAIRS
ON THE
GENERIC ENVIRONMENTAL IMPACT REPORT ANNUAL UPDATE

PROJECT NAME	: Logan International Airport Generic Environmental Impact Report 1996 Annual Update
PROJECT LOCATION	: Boston/Winthrop
EOEA NUMBER	: 3247
PROJECT PROPONENT	: Massachusetts Port Authority (Massport)
DATE NOTICED IN MONITOR	: September 23, 1997

As Secretary of Environmental Affairs, I hereby determine that the 1996 Annual Update to the Logan International Airport Generic Environmental Impact Report (GEIR) **adequately and properly complies** with the Massachusetts Environmental Policy Act (M.G.L. c. 30, ss. 61-62H) and with its implementing regulations (301 C.M.R. 11.00).

In general, the 1996 Annual Update is responsive to the requirements laid out in the Certificate on the 1994/95 GEIR. The analysis presented in the Annual Update supplements and complements the information in the GEIR, and the two documents together present a comprehensive and thorough picture of Logan Airport planning, operations, impacts, and mitigation. I commend Massport and its consultant team for producing a report of quality and distinction.

KEY ISSUES FROM 1994/95 GEIR

The 1996 Annual Update addresses the two critical issues which I identified as unresolved in the 1994/95 GEIR. In particular, the Annual Update has put the analysis of Logan Airport planning into the context of regional intermodal planning, and has demonstrated that the various transportation agencies are in fact coordinating their plans and actions so as to attempt to minimize overall

impacts from Logan Airport. Obviously, the need to coordinate with other agencies and continually refine analysis and check assumptions does not stop with the Annual Update, and I expect that regional intermodal planning will become an important part of future GEIRs, and that future filings will document Massport's continued efforts on this issue. I also note that the Annual Update has not satisfied all commenters with its discussion of regional transportation planning, in particular with the relationship of the airport to the proposed North-South Rail Link and Urban Ring.

However, after reviewing the Annual Update, I am confident that Massport's conclusions are justified, and that the basic framework for analysis is now in place with respect to regional transportation planning issues. Given the status of planning efforts by others, I believe that Massport has done as much as is feasible at this time to develop concrete actions for optimizing multi-modal ground transportation access. Future GEIRs should focus on refining the intermodal analysis as new plans are developed and new information becomes available. I will outline my expectations on this issue for the next GEIR in more detail below.

The other main outstanding issue from the 1994/95 GEIR was the related concern that Massport was not efficiently coordinating with other agencies (particularly the Massachusetts Bay Transportation Authority) in developing plans to maximize public transportation access to Logan Airport. The Annual Update demonstrates that such coordination is occurring, and that the agencies are working together to maximize public transportation access. Again, satisfaction with the discussion in the Annual Update is not universal, and I expect that Massport and the other transportation agencies will continually revisit their forecasts, assumptions, and mitigation goals. However, the Annual Update has responded to the requirements of the GEIR Certificate, in that it has provided context and demonstrated that airport planning is not taking place in a vacuum.

The issue of context and coordination has been successfully resolved in the Annual Update. The GEIR ~~process at~~ Logan can and should now squarely focus on the question of whether Massport's planning and mitigation commitments represent maximum feasible mitigation for impacts described in the GEIRs and Annual Updates. In this respect, the planning process for Logan 2000 (which began in earnest in the 1991 Draft GEIR) has matured with the 1996 Annual Update.

ORGANIZATION OF CERTIFICATE

I have organized the remainder of this Certificate to respond to issues raised roughly in the order in which they were presented in the Annual Update, although I have for the most part incorporated discussion of issues raised in the technical appendix into the discussion of the environmental impact analyses.

ACTIVITY LEVELS

In 1996, passenger levels at Logan Airport reached 25.1 million, representing an increase of 3.9% from 1995. However, the number of aircraft operations declined by 2.2% to 456,226. Cargo volume increased by 2.1% to 743 million pounds. It is difficult to discern a trend based on one year's worth of data, although it appears that the 1999 and 2010 passenger forecasts developed in the GEIR are still reasonable estimates. The next GEIR, due out in calendar year 2000, will present a good opportunity to compare predicted vs. actual 1999 passenger forecasts, and I anticipate that the 2000 GEIR will reevaluate the 2010 forecasts as well. I will not require further analysis of passenger forecasts in the next Annual Update.

The 1996 Annual Update projects better than a 25% increase in cargo operations from 1996 to 1999, and more than a 56% increase by 2010, with the vast majority of this growth (80%) handled by all-cargo carriers. Predicted growth in cargo operations thus far outpaces passenger growth. Since cargo operations (especially all-cargo operations) tend to occur at night, the large projected increase in cargo operations raises concerns with increased nighttime noise impacts.

The latest research on noise and sleep disturbance (included in appendix F) suggests that sleep disturbance from noise caused by single-event aircraft overflights may be less of a problem than previously thought. However, the latest research shows that fully 10% of a population will awaken from an indoor Sound Exposure Level of 80 dB. With sharp increases in nighttime cargo flights, sleep disturbance remains a serious issue. (I note that increases in nighttime cargo flights could also increase L_{dn} levels, and previous studies have linked increasing annoyance with increasing L_{dn} levels.)

My Certificate on the 1994/95 GEIR also raised the concern of increased nighttime noise levels, particularly after the conversion of the fleet to all Stage 3 aircraft. The Certificate

also discussed the broader issue of Logan Airport's ability to remain with the Cumulative Noise Index (CNI) cap of 156.5 effective perceived decibels after 2010. (It is still an open question as to whether the CNI cap even represents maximum feasible mitigation under MEPA.)

The Annual Update presents much updated noise data, but it is still unclear how Massport and the Federal Aviation Administration (FAA) are planning for the possibility that an all Stage 3 fleet at Logan Airport may produce noise impacts unacceptable by Massport's own standards (not to mention the much stricter standards advocated for by many community members). I recognize that this issue will be difficult to resolve, given the federal "open sky" policy, but the time to begin planning is now, before the problem becomes even more acute. The 2000 GEIR must therefore include discussion of this issue as part of the noise analysis, and should detail what steps Massport can take, both on its own and with FAA cooperation, to address the issue of excessive nighttime and cumulative noise from an all Stage 3 fleet.

REGIONAL TRANSPORTATION PLANNING

As noted above, this was the most critical issue left unresolved by the 1994/95 GEIR. The GEIR Certificate included strong language on how the Annual Update should address regional transportation planning issues and the relationship to Massport's plans for Logan Airport. Massport has demonstrated that it is coordinating its planning with other transportation agencies, and that this planning effort is aimed at minimizing cumulative impacts from Logan Airport operations. The Annual Update includes estimates of potential passenger diversions from Logan, and outlines how Massport planning encourages those diversions. Several commenters have questioned whether this discussion represents a "concrete plan" for diversions required by the GEIR Certificate. In general, the Annual Update has met the requirements I laid out in the GEIR Certificate. The directives in the GEIR Certificate were meant to force Massport to look more seriously at potential diversions, and explain how its planning and coordination with other agencies could impact potential diversions. The Annual Update has performed this task.

The lack of an explicit diversion estimate attributable to the North-South Rail Link project has generated some of the most heated criticism of the Annual Update. The comment from the North-South Rail Link Project Citizens Advisory Committee (CAC) estimates that up to 215,000 annual passenger diversions from

Logan Airport will occur as a result of the Rail Link. The Annual Update does not expressly account for these potential diversions.

While I am sensitive to the concerns expressed by the commenters, I note that the CAC's estimates for Logan diversion attributable to the North-South Rail Link represent less than 3% of the total Logan diversions calculated by Massport. I further note that the other components of the diversion estimates (video conferencing and regional airports) have generated virtually no negative commentary, and that the total diversion estimate in the Annual Update has been rounded up to account for other factors (presumably, for influences such as the North-South Rail Link). Even within the context of inter-agency cooperation, I understand Massport's decision not to include such estimates (the federal and state peer review process for North-South Rail Link passenger diversions was still ongoing at the time of publication of the Annual Update). Therefore, I conclude that the lack of explicit North-South Rail Link diversion estimates does not seriously compromise the analysis or the conclusions Massport has reached in its discussion of regional transportation issues.

The North-South Rail Link environmental review should be largely concluded by the time of the 2000 Logan GEIR. I expect that the GEIR will incorporate this information, and update the estimates of potential passenger diversions based on the analysis of ongoing trends, evolution of Massport's own planning, and coordination with other transportation agencies. The next Annual Update need not further analyze this issue. However, to the extent that passenger diversions from the North-South Rail Link may impact the alternatives analysis for the Logan Airside Improvements Project, the Airside DEIR should incorporate the most recent figures available from the North-South Rail Link (and other regional rail projects).

GROUND ACCESS IMPROVEMENT

The 1996 Annual Update serves its purpose of updating 1996 ground access conditions on the airport, and has also adequately addressed the larger ground access issues identified in the GEIR Certificate, as discussed below.

The impact of the opening of the Williams Tunnel is clearly reflected in a sharp increase in on-airport Vehicle Miles Traveled (VMT) (up 31% since 1995) and Average Daily Traffic (up 9%). Some of the VMT increase is attributable to inefficiencies in the road network necessitated by Central Artery/Tunnel and

Logan 2000 construction. The current roadway configuration makes meaningful data collection on the relative impact of the tunnel and construction on airport-bound vs. through traffic virtually impossible (although the large increases in taxi dispatches and parking exits in 1996 suggests that at least some of the VMT increase attributed to the Williams tunnel opening is directly related to airport operations). Massport anticipates that more reliable data will become available in the relatively near future, and Massport will analyze this data in future Annual Updates or GEIRs.

Growth in High Occupancy Vehicle (HOV) access to the airport continued to far outpace growth in overall passenger traffic, with Logan Express and private scheduled HOV services continuing to see rapid growth. Logan employee HOV access also experienced a significant increase in 1996, and Massport instituted the Logan Transportation Management Association to work on continued improvement in employee access.

The use of MBTA rapid transit to the airport declined for the second year in a row in 1996, both in absolute numbers and as a percentage of non-automobile trips. (The number of airport trips accommodated by the Blue Line has remained within a narrow range for more than ten years.) The GEIR Certificate had noted the flatness of MBTA ridership with concern, and required that Massport demonstrate it is coordinating with the MBTA to address the issue and to minimize impacts. The Annual Update has adequately responded to this charge. The Annual Update demonstrates that Massport and the MBTA are coordinating their activities so as to reduce cumulative impacts, and to maximize the attractiveness of transit access. The redesign of the People Mover into the Airport Intermodal Transit Connector has generated favorable commentary, and should help address the transit access issue.

There are continuing concerns with ground access which Massport should address in the 2000 GEIR. The Annual Update reaffirms the 35.2% HOV/transit goal at 37.5 million passengers annually as a cornerstone of Massport's ground access strategy. Once again, comments have urged a higher target percentage, and have pointed out (quite correctly) that a 35.2% HOV/transit mode share at 37.5 million annual passengers equates to 7 million additional yearly single occupant vehicle trips compared to current conditions (31.1% HOV/transit mode share at 25.1 million annual passengers). Even with improved roadway infrastructure at 37.5 million annual passengers, an additional 7 million automobiles represents a major impact, and one which I will follow closely to ensure that

Massport is developing maximum feasible mitigation. I expect that Massport will continually revisit the issue of target HOV/transit percentage, and report in future GEIRs.

The lack of discussion of the effect of the North-South Rail Link on transit access to the airport has generated sharp criticism of the Ground Access chapter. The North-South Rail Link CAC maintains that the North-South Rail Link will divert 500,000 annual trips to Logan from auto to transit, and that the Annual Update should have incorporated this information. However, the overall discussion of Ground Access issues is strong in the Annual Update, despite the lack of Rail Link numbers. When final estimates of Rail Link auto-to-transit diversions are publicly available, Massport should analyze the significance of the diversions in the context of the overall ground access strategy at Logan Airport, and report in the next GEIR.

Massport will soon initiate the MEPA review of the Airport Intermodal Transit Connector, most likely in the form of a Notice of Project Change to the People Mover project. The upcoming filing should address the outstanding concerns about the effect of the North-South Rail Link on transit ridership to Logan Airport. The upcoming review will provide a convenient forum to focus on transit access to the airport. When developing documentation for the upcoming review, Massport should consider the comments received on this Annual Update concerning ground access issues.

The Annual Update reports that Massport rescinded the "first hour free" parking policy on September 1, 1997, and includes results of a monitoring and evaluation program which showed negative impacts on airport roadways and parking patterns (including the increase in parking exits mentioned above). Since the policy is now defunct, I am not requiring further analysis of the issue. However, I remind Massport that any resumption of "first hour free" would require additional review under MEPA.

NOISE

The 1996 Annual Update has responded adequately to the requirements in the GEIR Certificate concerning noise. The technical appendix contains useful and detailed information, while the main text provides a solid analysis of major noise issues. Many of the issues raised in the noise analysis are ongoing and require continuous monitoring. The Annual Updates represent appropriate forums to serve this updating function.

The 1996 Annual Update reports an overall slight improvement in noise conditions, with declines in the population within the 65 dBA L_{dn} contour and stability in the CNI index. However, the nighttime CNI increased, due to an increase in cargo flights. This has raised concerns from the City of Boston agencies, and I have discussed the importance of this issue above. I expect a full discussion of potential cargo flight noise mitigation in the next GEIR.

The eligibility criteria for residential soundproofing continues to generate significant concerns, especially in close-in areas subjected to significant low-frequency noise, but outside the 65 dBA L_{dn} contours. While Massport's soundproofing program satisfies FAA criteria, many commenters believe that additional mitigation is necessary for Massport to satisfy its obligations under MEPA. In other contexts, I have determined that compliance with applicable performance standards or regulations does not perforce establish compliance with MEPA (although compliance with performance standards does provide a benchmark for required analysis under MEPA).

The issue of expanded soundproofing deserves more discussion. Massport should work with the FAA to explore expansion of the federally-sponsored soundproofing program, and should consider what actions it can take on its own to address the concerns of the close-in communities. The next Annual Update should update the status of any discussions, or development of any programs.

AIR QUALITY

The 1996 Annual Update reports a small increase in emissions of Volatile Organic Compounds (VOC) and carbon monoxide (CO), and a decrease in emissions of nitrogen oxides (NO_x). The Annual Update forecasts the same basic trends as the GEIR (i.e., short term declines in pollutant levels followed by long term increases for most pollutants). The Department of Environmental Protection (DEP) notes that Logan Airport ranks as the Commonwealth's sixth largest emitter of NO_x, and many of the comments received have expressed concern that Massport should place greater emphasis on air quality mitigation.

DEP suggests development of air emissions caps analogous to the caps already in place for noise, and/or the development of an emissions offset program. These suggestions may represent feasible mitigation for demonstrated impacts. I request that Massport and DEP consult further on this issue (remembering that my fundamental concerns are allowing Massport to accommodate

growth without increasing impacts where feasible, and assuring that future filings continue to analyze cumulative air quality impacts from landside and airside operations). Massport should report the results of these discussions and development of any mitigation or programs in the next Annual Update or GEIR, as appropriate.

The relationship between air quality and public health in the context of Logan Airport continues to generate comments. Massport adequately documented the (lack of) correlation between proximity to Logan and increased health risks in the GEIR. Nonetheless, the issue remains a concern among commenters. Massport should continue to consult with public health agencies, and provide a status update in the next GEIR.

WATER QUALITY

The 1996 Annual Updates reports that compliance with National Pollutant Discharge Elimination System (NPDES) performance standards for oil and grease declined at 3 of the 4 regulated outfalls in 1996, although compliance levels remained generally high. Massport should carefully analyze the data from 1997, and report in the next Annual Update whether there is a trend toward reduced NPDES compliance, and if necessary what steps Massport is taking to reverse that trend.

The Annual Update concludes that a conservation restriction on Wood Island Bay Marsh is "feasible from an administrative perspective," although the Annual Updates rejects a restriction based on "safety and security concerns." However, the Annual Update does not provide any information regarding why the granting of a restriction would compromise security. As the Boston Redevelopment Authority points out, restricting or controlling access to the marsh may address the security concerns. The next GEIR should reevaluate this issue.

COMMENTS

The comments received on the Annual Update are generally thoughtful and detailed. Except where otherwise specified in this Certificate, Massport may respond to the comments received either in the next Annual Update or the next GEIR (although I strongly encourage response in the next Annual Update). I encourage Massport to use the Response to Comments format used in the Final EIR for the International Gateway Project, given the fairly small number of comments received.

PROCEDURAL

Given the overall strength of the analysis in the 1996 Annual Update, the 1997 Annual Update can restrict itself to providing an update on 1997 conditions, and respond to those issues explicitly noted in this Certificate as requiring response in the next Annual Update. Otherwise, Massport should address issues noted in this Certificate in the 2000 GEIR (or in project-specific EIRs where specified). Massport should file the 1997 Annual Update no later than October 15, 1998 (although I encourage Massport to file sooner, given the relatively few requirements for the next Annual Update). At a minimum, Massport should circulate the 1997 Annual Update to those who commented on the 1996 Annual Update.

12/1/97
DATE

Trudy Coxe

Comments received :

10/23/97	Bicycle Coalition of Massachusetts
11/20/97	Boston Transportation Department
11/21/97	Massachusetts Department of Public Health
11/21/97	Winthrop Noise, Air Pollution and Airport Hazards Committee (WNAPAHC)
11/22/97	WNAPAHC
11/24/97	WNAPAHC
11/24/97	Boston Redevelopment Authority
11/24/97	Department of Environmental Protection
11/24/97	AIR Inc (McGowan et al)
11/24/97	North South Rail Link Project CAC
11/24/97	National Association of Railroad Passengers
11/25/97	WNAPAHC
11/25/97	Boston Environment Department
11/25/97	Conservation Law Foundation

TC/ASP/asp

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October 16, 1998

CERTIFICATE OF THE SECRETARY OF ENVIRONMENTAL AFFAIRS
ON THE
GENERIC ENVIRONMENTAL IMPACT REPORT ANNUAL UPDATE

PROJECT NAME	: Logan International Airport Generic Environmental Impact Report 1997 Annual Update
PROJECT MUNICIPALITY	: Boston/Winthrop
PROJECT WATERSHED	: Boston Harbor
EOEA NUMBER	: 3247
PROJECT PROPONENT	: Massachusetts Port Authority (Massport)
DATE NOTICED IN MONITOR	: August 26, 1998

As Secretary of Environmental Affairs, I hereby determine that the 1997 Annual Update to the Logan International Airport Generic Environmental Impact Report (GEIR) submitted on this project adequately and properly complies with the Massachusetts Environmental Policy Act (M.G.L. c. 30, ss. 61-62H) and with its implementing regulations (301 C.M.R. 11.00).

General

The Annual Update has provided an adequate "snapshot" of impacts and operations at Logan Airport in the calendar year 1997. Most of the environmental parameters show normal year-to-year variations generally consistent with the overall forecasts laid out in the 1994/95 GEIR (although I am concerned with a trend toward reduced use of the Blue Line, as described below). The

Annual Update has adequately addressed most of the issues identified for prompt response in the Certificate on the 1996 Annual Update. However, as discussed below, the Annual Update does not resolve every issue identified in the previous Certificates, and several important issues will require follow-up in the 1999 GEIR (due for review in calendar year 2000, and renamed the "Logan Airport Environmental Status Report").

Procedural

Massport should file the 1998 Annual Update by October 15, 1999. This document should consist of a brief summary of 1998 conditions with limited narratives where necessary to support or explain data presented. The 1998 Annual Update should also contain a Proposed Scope for the 1999 Environmental Status Report. This Proposed Scope should serve as a jumping off point for discussion of the content of the 1999 GEIR, and should incorporate Massport's own plans for environmental studies, as well as the requirements laid out in the various MEPA Certificates dating back to the Certificate on the 1994/95 GEIR. The Proposed Scope will be reviewed during the MEPA review of the Annual Update, followed by the issuance of a Certificate which will contain the binding Scope for the 1999 Environmental Status Report.

Massport has asked that I rename the Annual Updates as "Annual Environmental Data Reports" and that I rename the GEIR as the "Logan Airport Environmental Status Report." Massport has also asked that I allow the submission of the GEIR on a five year schedule, with more frequent filings if Massport and the Secretary agree that additional filings are appropriate.

The revised MEPA regulations (effective July 1, 1998) eliminate specific references to Generic EIRs. I therefore do not object to renaming the Logan GEIR. However, the 1998 Annual Update should remain as an "Annual Update," for the sake of consistency until the current GEIR review cycle is complete. Massport may

title the 1999 GEIR as the "1999 Logan Airport Environmental Status Report."

With the Logan 2000 planning process now winding down, and the basic framework for analysis of impacts and mitigation in place at Logan Airport (see the Certificate on the 1996 Annual Update), I believe a new filing process is worth considering. My experience with the GEIR process has shown that the Annual Update in a year following a GEIR is invariably a large document which serves to clarify issues raised during the GEIR review, and respond to the numerous comments received. The Annual Updates in subsequent years tend to generate considerably less interest, and provide only one additional data point in each environmental category, which limits their value in spotting trends or identifying important new issues. I believe it makes more sense to focus resources on the GEIR process itself.

For the next cycle of review, I propose that Massport submit a Draft Environmental Status Report for 1999 in calendar year 2000, followed by a Final Environmental Status Report in calendar year 2001, which responds to issues raised by review of the Draft and incorporates any new data available. Thereafter, Massport should submit on an annual basis a more abbreviated "Environmental Data Report." If an Environmental Data Report shows significant unexpected cumulative impacts, or if Massport should propose major new initiatives at Logan with the potential for significant (unstudied) cumulative impacts, I will reconsider the need for an expanded Environmental Data Report or accelerated Environmental Status Report. In calendar year 2004, Massport should submit another Proposed Scope to start the process anew.

The Proposed Scope submitted next year should include a summary of the proposed process for submissions and review during the next cycle, so that the Secretary may have the benefit of public comment on the proposed procedures prior to making any final decision. The Certificate on the 1998 Annual Update will include any revisions to the overall Logan environmental review process.

Planning Context

In comments on the 1994/95 GEIR and 1996 Annual Update, the Department of Environmental Protection (DEP) had commented that a statewide airport assessment would prove valuable for putting the role of Logan Airport into context. Massport has responded to DEP's comment with a commitment to participate in any discussions on the subject, although Massport maintains that the Massachusetts Aeronautics Commission (MAC) and the Executive Office of Environmental Affairs (EOEA) should take the lead in any statewide assessments.

The Certificate on the 1994/95 GEIR found merit in this suggestion by DEP, and I still agree that the idea of a statewide environmental assessment of airport operations, needs, and impacts should prove valuable to both transportation and environmental agencies. It is my understanding that MAC has undertaken such an analysis from an aviation and economic perspective. Integrating environmental concerns into the analysis may represent the next logical step. I will follow up with MAC (and the Executive Office of Transportation and Construction) on this matter, and ask that EOEA and DEP staff be available for assistance.

Activity Levels

The number of passengers at Logan Airport increased 1.7% in 1997, while the number of operations increased 5.8%. Air travel at Logan Airport thus became less efficient than in 1996 (reversing the pattern of the previous year). No discernable trend emerges over the past few years with respect to operational efficiency, and the passenger and operations numbers for 1997 do not call into question any of Massport's basic assumptions in the 1994/95 GEIR (although it does not appear that Logan will reach the 29 million annual passengers forecasted for 1999 in the GEIR). The 1999 Environmental Status Report will present an opportunity to compare long term predictions from the 1994/95 GEIR with actual data.

Ground Transportation

The 1997 Annual Update reports that use of the MBTA Blue Line Airport Station declined for the third consecutive year (the decline occurred even after correcting for partial closure of the Blue Line for repairs during 1997). This trend is disturbing, as improving MBTA mode share is a critical component of Massport's overall ground transportation mitigation strategy. The Airport Intermodal Transit Connector (AITC) recently completed MEPA review, and this initiative (which replaces the People Mover concept) should help to eventually reverse this trend. However, the full benefits of the AITC are still several years away, and Massport and the MBTA have an unfavorable environmental trend underway now.

The 1998 Annual Update should include the most recently available MBTA Blue Line ridership data. In the meantime, Massport and the MBTA should consult on methods of achieving short-term improvement in transit use, pending full development of the AITC. (For example, although the introduction of MBTA token machines at terminals has been discussed as a possible transit enhancement for some time now, the effort appears to be stalled). The 1998 Annual Update should summarize the results of these consultations, and it should include Massport's concrete plans for mitigation -- in particular, strategies to increase employer participation in the Logan TMA, as discussed below. The 1999 Draft Environmental Status Report should also discuss the issue of transit ridership in depth.

Overall Logan Express ridership rose very slightly in 1997, with a decline in use by air passengers just more than offset by an increase in use by airport employees. From the discussion in the Annual Update, it appears that constraints in the parking supply at the suburban termini seems to be an important factor in explaining the relative stagnation of ridership levels in this highly successful program. Massport indicates it is currently studying the possibility of adding a new Logan Express route. The 1999 Draft Environmental Status Report should include the

latest planning for this potential expansion in service. Also, the Environmental Status Report should investigate the feasibility of expanding the parking supply at new and existing termini, and should explore the potential for increased coordination with MBTA and other transit services as a method of relieving pressure on the existing parking supply.

The Annual Update reports a healthy (7%) jump in unscheduled High Occupancy Vehicle (HOV) service in 1997. However, the manner in which Massport defines an unscheduled HOV trip leaves open the possibility that some unscheduled HOV service more closely resembles a taxi service than a true HOV service. Massport should attempt to discern to what extent unscheduled HOV service is functioning as a taxi service, and report back in the Environmental Status Report. Massport should also clearly explain any difficulties in gathering this information. The Environmental Status Report should include a best estimate of how many unscheduled HOV trips carry single riders, and how redefining single-passenger unscheduled HOV trips as non-HOV trips would impact the overall HOV percentage. (Massport may also attempt to discern how many taxi trips carry more than one passenger, and may count such trips as HOV trips, provided that the Environmental Status Report provides sufficient explanation of study methodology and demonstrates an appropriate degree of rigor in data collection.)

The Boston Environment Department has questioned whether the employee shuttles from parking lots in Chelsea should count as HOV trips. Although the 1994/95 GEIR did show a net environmental benefit in using the Chelsea lots, I understand the concern that the Chelsea lots may more appropriately be considered as primarily Single Occupant Vehicle trips (albeit with mitigation) rather than HOV trips. The Environmental Status Report should calculate the effect on the overall HOV percentage if the shuttle trips are not considered HOV trips.

The Annual Update reports that membership in the Logan Transportation Management Association (TMA) has risen to include

about 20% of all airport employees. While the trend is positive, I am concerned, particularly in light of the decline in transit ridership, that Massport should be more aggressive in bringing in new members. (By comparison, participation rates are much higher among employees of the Longwood Medical Area and at several suburban office parks.) Both next year's Update and the 1999 Draft Environmental Status Report should describe Massport's strategies and results in increasing employer participation rates in the TMA and in encouraging employers' support for such concrete measures as ridesharing and the subsidy of MBTA and Logan Express use by their employees.

Use of water transportation to access the airport rose in 1997, thanks to the success of the Quincy Fore River service and increased use of water taxis (the Rowes Wharf service continued to decline in use). The 1999 Environmental Status Report should address what measures Massport can feasibly take to further increase use of water transportation to the airport, as well as discuss the feasibility of reversing recent declines in use of the Rowes Wharf service.

Noise

The Annual Update reports a significant increase in the population within the 65 dBA L_{DN} contours. Much of this increase results from difficulties in new flight tracks and procedures for Runway 27. Massport maintains that the problem has been corrected, and that the 1998 data on noise contours will show a significant improvement.

The difficulties with Runway 27 procedures underscore the need to address the issue of mitigation for noise under flight tracks. The scope for the Airside Improvements EIR (EOEA #10458) requires a detailed analysis of this issue, including analysis of potential mitigation trade-offs and a full discussion of the Preferential Runway Advisory System (PRAS). If the 1999 Environmental Status Report is submitted prior to the Airside Draft EIR, I will require that the Environmental Status Report

address the issues related to PRAS and flight path noise mitigation and trade-offs.

The comments received continue to raise concerns with the eligibility criteria for residential sound proofing programs. Massport has indicated that it will undertake a study of "hill effects" to better understand impacts on areas not directly under flight paths. The Environmental Status Report should include any available summaries of this report, and should discuss the implications of the study for soundproofing eligibility. The Environmental Status Report should also respond to previous requests to examine equitable methods of expanding eligibility.

A related issue raised in the Certificate on the 1996 Annual Update concerns the possibility that noise from an all Stage 3 fleet may exceed the goal for the Cumulative Noise Index under a high growth scenario in 2010. The 1997 Annual Update does not directly address this question, although I left full discussion of the issue to the 1999 Environmental Status Report. However, I wish to remind Massport of the importance of this issue, the complexities involved in finding a solution, and the need to work with the Federal Aviation Administration to address the problem in a proactive manner.

Air Quality

The Certificate on the 1996 Annual Update had asked Massport to consider a cap on net airport emissions (analogous to the Cumulative Noise Index) as a way to operationalize previous Massport commitments to living within the existing environmental footprint. Although Massport and DEP have held initial discussion on this issue, the Annual Update does not reveal any concrete progress. Massport should continue to investigate this and other forms of air quality mitigation measures with DEP and other relevant agencies, such as the Federal Aviation Administration, prior to preparation of the 1999 Environmental Status Report. In particular, in next year's Annual Update Massport should report on the feasibility of market-based

incentives, such as the emissions-based landing fees that DEP has suggested, and which several European airports have already adopted.

The 1997 Annual Update reports increased emissions from Ground Service Equipment (GSE). GSE emissions are projected to form an increasing percentage of total airport emissions in the coming years (by 2010 accounting for over half of the carbon monoxide emitted from all airport sources and nearly a quarter of all VOCs). Clearly, GSE emissions represent an area where a concerted effort at mitigation could reap large environmental benefits. The Annual Update demonstrates that Massport is doing a commendable job at converting its own fleet of GSE to cleaner fuels, but the Update leaves open the possibility that a more aggressive approach to tenant GSE is warranted. The 1999 Environmental Status Report should evaluate methods of encouraging greater conversion of the tenant GSE fleets. I also recommend that Massport consult further with DEP and the federal Environmental Protection Agency on this issue.

Water Quality

The Annual Update reports that low water flows from the Porter Street Outfall will eventually be diverted to the Maverick Street Outfall for treatment prior to discharge. The Environmental Status Report should update the schedule for these improvements, and analyze whether addition of pollution control equipment at the Porter Street Outfall would prove feasible.

Circulation

At a minimum, Massport should circulate the 1998 Annual Update and Proposed Scope to the parties listed below as submitting written comments on the 1997 Annual Update. I also encourage Massport to circulate the documents widely among agencies, groups, and community members.

Comments

The 1997 Annual Update has generated a body of generally thoughtful commentary. I will again give Massport the option of either responding to comments received in the Annual Update or in the 1999 Environmental Status Report. However, Massport should carefully consider the comments received relating to topics appropriate for the Proposed Scope.

10/16/98 Trudy Coxe
DATE Trudy Coxe

Comments received :

9/25/98	Coastal Zone Management
10/2/98	Winthrop Noise, Air Pollution, and Airport Hazards Committee
10/8/98	Vincent Tino
10/9/98	Metropolitan Area Planning Council
10/9/98	Department of Environmental Protection NERO
10/9/98	The Boston Harbor Association
10/9/98	Winthrop Noise, Air Pollution, and Airport Hazards Committee (from Craighead Glick LLP)
10/13/98	National Association of Railroad Passengers
10/13/98	Boston Environment Department
10/13/98	Boston Transportation Department
10/14/98	Boston Redevelopment Authority

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December 10, 1999

CERTIFICATE OF THE SECRETARY OF ENVIRONMENTAL AFFAIRS
ESTABLISHING THE SCOPE FOR THE
1999 LOGAN AIRPORT ENVIRONMENTAL STATUS AND PLANNING REPORT
AND CERTIFICATE ON THE 1998 ANNUAL UPDATE

PROJECT NAME	: Logan Airport Environmental Status and Planning Report (formerly the Logan Airport Generic Environmental Impact Report)
PROJECT MUNICIPALITY	: Boston/ Winthrop
PROJECT WATERSHED	: Boston Harbor
EOEA NUMBER	: 3247
PROJECT PROPONENT	: Massachusetts Port Authority
DATE NOTICED IN MONITOR	: October 23, 1999

As Secretary of Environmental Affairs, I hereby find that the 1998 Annual Update to the Logan Airport Generic Environmental Impact Report (GEIR) adequately and properly complies with the Massachusetts Environmental Policy Act (G. L. c. 30, ss. 61-62H) and with its implementing regulations (301 CMR 11.00). I also hereby establish the scope for the analysis to be presented in the 1999 Logan Airport Environmental Status and Planning Report (or "ESPR," the new name for the GEIR).

1998 Annual Update

The Annual Update has served its purpose of providing a relatively concise summary of 1998 activity and impact levels. The Annual Update reports a 3.8% increase in passenger levels over 1997 (a 10.2% increase in international passengers), and a 5.2% increase in aircraft operations. In 1997, Logan Airport ranked as one of the ten busiest airports in the world in terms of aircraft operations. The Annual Update has described a number of positive events in 1998 (for example, a decrease in noise-exposed population, decreases in VOC and CO emissions, and an increase in Blue Line ridership and HOV ridership). However, the 1998 Annual Update also showed that CNI for nighttime operations and for cargo jets increased. In addition, overall airport operations became less efficient as (for the second year in a row) increases in number of operations

proportionally outgrew increases in passenger levels. Although it is very difficult to discern ongoing trends from one year of data, the 1998 statistics help define certain issues that will require follow-up in the ESPR.

In general, the Annual Update has adequately addressed most of the outstanding issues identified in the Certificate on the 1997 Annual Update as requiring immediate response. As discussed below, there are several issues that the Annual Update did not fully address. I have incorporated these issues into the scope for the 1999 ESPR.

Purpose of the ESPR

The ESPR has evolved from a retrospective status report on airport operations to a much broader analysis that also provides a prospective assessment of long range plans. The ESPR has grown into an important part of the planning process for Logan Airport, and it has begun to attract national and international attention as a model for systematically reviewing an undertaking as complex as the maintenance and operation of a major international airport.

The ESPR provides a "big picture" planning context, in which large scale policy and planning issues, as well as the cumulative impacts associated with current and anticipated activities, are addressed. The ESPR complements the project-specific EIRs for individual projects, to help focus the review processes and ensure that segmented project review does not occur in the context of MEPA review at Logan Airport. (I note that the federal review process does not include the formal equivalent of the ESPR, so my comments regarding segmentation are necessarily limited only to the state review process.) The ESPR does not replace project-specific EIRs, nor does it relieve Massport of its obligations under MEPA for project specific analysis of impacts and mitigation. The project-specific reviews, through the Section 61 mechanism, also serve as a vehicle for ensuring that large-scale mitigation commitments are more closely tied to individual actions at the airport.[1]

Focus of the 1999 ESPR

Massport has long used 1999 as a major planning horizon year. At the time of the previous document, the 1995 GEIR, Massport was in the midst of the Logan 2000 Modernization program. As shown in this Annual Update, most of the individual projects that comprise Logan 2000 have now completed MEPA review, and have begun (or in some cases completed) construction. These projects include the West Garage (EOEA #9790), Phase I completed 1998; the International Gateway (EOEA # 9324), under construction; the replacement Hilton Hotel (EOEA #10746), completed 1999; Jet Fuel Storage and Distribution Facility (EOEA

1 I therefore again disagree with those commenters who have suggested that the MEPA review of Logan Airport projects has been improperly segmented. However, I recognize that the risk of segmentation remains real with a "project" on the temporal and physical scale of Logan Airport. The continuous refinement and updating of the ESPR scope reflects the ongoing efforts of this office to minimize the risk of segmented environmental review.

#9794/10430), completed 1999; and the Airport Intermodal Transit Connector (AITC, EOEA #10235), under construction. The principal projects still to complete MEPA review are the Airside Improvements Planning Project (EOEA #10458), for which the Draft EIR was found adequate in May 1999; and the Terminal A Replacement (EOEA #12096), for which an ENF has just been filed.

Even before the launching of Logan 2000, Massport has been using 1999 as a key year in its long-term predictions of future passenger levels. As discussed at length in my Certificate on the Airside DEIR, it now appears highly likely that Logan will not attain the 29 million passengers/year level previously predicted for 1999, considering that 1998 passenger levels were 26.5 million, a 3.5% increase over the previous year. It also appears likely, based upon current trends, that Logan will not reach the 37.5 passengers/year previously predicted as the "low end" estimate for the year 2010 -- much less the 45 million passengers/year "high end" estimate. In the 1999 ESPR, Massport should revisit its 2010 passenger level scenarios in light of current trends (including the passenger diversions to other regional airports and Amtrak High-speed Rail service to New York, as predicted in the Airside DEIR).

The 1999 ESPR therefore provides an important opportunity to compare predicted trends with actual values. The analysis presented in the 1999 ESPR will prove invaluable to determining how well current planning is responding to actual needs. The analysis should also provide important insights into how reliable future projections might prove to be. I have therefore kept the scope for the 1999 ESPR very similar to the combined scopes for the 1995 GEIR and 1996 Annual Update. I anticipate that the opportunity to compare predicted with actual values for 1999 will lead to refinement of the scope for subsequent ESPRs and Environmental Data Reports (the new name for Annual Updates).

As previous Certificates have stated, the review process has matured to the point where the central focus of the ESPR process must be whether Massport's planning and mitigation commitments represent maximum feasible mitigation for impacts described in the ESPR. The comment letters and the testimony at the public hearings relating to the Airside DEIR demonstrated the burden of cumulative noise, air pollution, and traffic impacts that neighboring communities will continue to bear as air traffic increases, independent of that specific project. This broader principle of fairness, and a concern with the cumulative impacts of airport operations, has informed my approach to the MEPA review of Logan.

Massport's fundamental environmental commitment, as expressed in the 1994/95 GEIR, is to "reduce or minimize, wherever practical, the environmental impacts of the operation of Logan Airport as annual passenger volumes rise in the future." With that goal in mind, I have added several requirements to the scope to investigate the feasibility of additional mitigation for impacts, particular with respect to noise and air quality, with the goal of maintaining or (preferably) reducing the existing envelope of cumulative environmental impacts from airport operations.

SCOPE

Appendix E of the Annual Update includes an outline of a proposed scope for the 1999 ESPR. The scope appears generally appropriate. The proposed scope basically follows a format similar to the last GEIR, updated as necessary in response to the various Certificates related to Logan issued since that time.[2] I therefore accept the proposed scope submitted by Massport, with the following additional provisions outlined below. I note that in my Airside DEIR Certificate, I required Massport to address in the FEIR a number of issues relating to airport-wide impacts, notably in the areas of regional transportation and noise. To ensure the usefulness of the ESPR as a reference document, those analyses should also be incorporated into the ESPR (although the supporting technical analysis may be omitted).

Regional Transportation

The Annual Update discusses Logan's role in the regional transportation network, which also includes the rapidly growing regional airports in Providence (4.6 million passengers in 1998, up 14%) and Manchester, NH (1.9 million passengers in 1998, up 74%), the currently underused facility at Worcester (only 80,000 passengers in 1998, down 12%), and the three-hour high speed rail service to New York slated to begin later this year. The Airside DEIR estimated a potential diversion of 7.3 million passengers/year from Logan to regional alternatives (which also include teleconferencing) by the year 2010, based solely on market forces without any additional intervention by Massport or other state transportation agencies. Taken together, these figures suggest that future passenger levels at Logan in the design year 2010 are likely to remain at or below the lower projected level of 37.5 million, rather than attaining the "worst case" 45 million level.

To maximize the efficiency of (and minimize the impacts from) the regional transportation network, Massport and the other state transportation agencies must show that they are doing all they can to ensure the integration of regional facilities with Logan as a regional airport system. In the Airside FEIR, I required Massport to report on the current status of ground access improvements to all four airports proposed by state transportation agencies in Massachusetts or other states (including but not limited to the projects mentioned above), including projected dates for completion of studies and/or construction. Second, the FEIR must also quantify the effects of these measures upon projected passenger levels at each of the airports, including Logan. The projections for ridership on Amtrak's high speed rail, and potential diversions from Logan, should also be updated to reflect the best current information. This information should also be incorporated into the ESPR.

2 The comment from the Boston Redevelopment Authority has pointed out several omissions from the proposed scope of issues brought up in Certificates issues since 1995, and several issues that lacked substantive analysis in this Annual Update. The ESPR should include these topics as well.

Air Quality

Logan Airport currently ranks as the sixth largest source of NO_x emissions in the Commonwealth, and by 2010 it is likely to become one of the three largest such sources. Currently, aircraft emissions are the only mobile air pollution sources included in the State Implementation Plan (SIP) emissions inventory that are not slated for meaningful near- or long-term emissions reductions. As I stressed in the Airside DEIR Certificate, it is the total air pollution from the airport which requires mitigation -- whether from planes, the ground fleet servicing these aircraft, or the vehicles carrying passengers and employees. It is time to implement the broad goal of maintaining or reducing Logan's overall environmental impacts, even as annual passenger volumes rise in the future.

Within the overall policy goal of reducing or minimizing impacts as passenger levels rise, Massport has committed to investigating methods of reducing emissions from each of the airport's major sources of air emissions. The Certificate on the Airside DEIR requested the development of a system of emission-based landing fees as a legally viable method of encouraging emission reductions (particularly of NO_x) from Logan Airport. This would be a system of market-based, revenue-neutral landing fees that reward cleaner planes with lower charges, on the principle that "the polluter pays." Airports in Europe, notably Zurich, are beginning to institute programs of this kind. The ESPR Proposed Scope includes the outline of a study of a market based landing fee system based on emissions.

I am pleased that Massport has committed to work actively on a program that holds such promise for air quality. The ESPR scope proposes the following process. First, Massport will model the emissions reductions attainable under a market-based emissions fee program, considered independent on any legal constraints on implementing such a program. Second, Massport will examine the effectiveness and practicability of alternative programs (such as purchases of emissions credits, or on-site emissions reduction in ground service vehicles) that would provide equivalent levels of reductions. Finally, Massport will develop an implementation program, including appropriate regulatory proposals (such as incorporation into the State Implementation Plan).

I welcome the opportunity to work with Massport further on this issue, and pledge the full cooperation of the EOEA agencies in helping Massport develop its program, including further input on how to measure reductions and ensuring their enforceability. The ESPR should consider the effectiveness and feasibility of extending any such program to other pollutants as well. I acknowledge that VOC and CO emissions are expected to remain under current levels for some time, and only show net long term increases under the highest growth scenarios in aircraft operations. Nonetheless, it makes sense to formalize a commitment to continue reducing these emissions, consistent with Massport's mandate under MEPA and its environmental goal of minimizing overall impacts as passenger levels rise.

The ESPR should detail the steps Massport is taking to minimize emissions from its tenants ground service vehicles and equipment (such as setting numerical targets on the conversion to clean-fuel vehicles, the infrastructure for such vehicles, and supply of electric power and preconditioned air to aircraft at gates). The ESPR shall also report on Massport's progress in ensuring the use of cleaner construction equipment at Logan, consistent with the recommendations contained in NESCAUM's Clean Air Construction Initiative.

Ground Transportation

The issue of ground transportation is clearly relevant to any discussion of cumulative impacts, and is an important component of any cumulative air quality analysis. The 1998 Annual Update shows some positive developments such as an increase in use of the MBTA Airport Station (after several consecutive declines) and an increase in Logan Express use by airport employees. However, the Annual Update indicates a likely decline in overall HOV use for calendar year 1999. The ESPR should include the 1999 figures for HOV use, and should discuss any limitations and/or ambiguities in the data (the City of Boston agencies have pointed out several concerns in recent comment letters).

One of the cornerstones of Massport's ground access strategy is a commitment to a 35.2% mode share for High Occupancy Vehicles (HOV) when passenger volumes reach 37.5 million annually. As previous certificates have pointed out, although this goal translates into an increase in HOV mode shares from the present, it also represents a substantial increase in the absolute number of non-HOV trips to the airport, due to the large increase in total number of passengers. Massport should consider a higher target percentage for HOV at 37.5 million annual passengers, and discuss the issue in the ESPR. Massport should also consider enforcement mechanisms for whatever HOV percentage emerges (for example, committing to set aside a sliding scale of funding for HOV/transit promotion and improvements if HOV goals do not reach the levels to which Massport has committed).

In the ESPR, Massport should also consider the consolidation of rental car lots and the courtesy vehicles serving them. I understand that this form of air quality mitigation is in practice at other airports in the United States. Finally, the analysis in the ESPR should reflect proposed MBTA improvements in transit access to Logan, including the AITC, the Blue Line modernization, and the Urban Ring. In particular, the Urban Ring project, shortly scheduled to conclude its major investment study and begin MEPA review, promises not only to improve transit access to Logan, but also to enhance mobility, economic development, and the quality of life in many of the communities most affected by the airport -- East Boston, South Boston, Roxbury, Cambridge, Somerville, Everett, and Chelsea.

Noise

No other single issue so dominates the public debate around Logan as the issue of aircraft noise. The issue united a diverse cross section of the metropolitan area during the recent review of the Airside DEIR. At the core of Massport's noise abatement policy stands the commitment, stated in the 1994/95 GEIR, to "minimizing nighttime noise and to addressing and responding to noise issues and complaints." The 1999 ESPR will include one of the most comprehensive studies of noise from Logan Airport yet undertaken. The proposed scope includes a wide range of noise studies, including new studies of "hill effects," a discussion of the feasibility of limitations on hush-kitted Stage 2 aircraft, and an analysis of the CNI cap implications of an all Stage 3 fleet for 2010.

Nonetheless, the intense ongoing debate about the future of the Airside Improvements has convinced me that additional analysis of and mitigation for noise impacts is warranted. Aircraft noise can have a profound influence on the lives of the people who live underneath flight paths. Massachusetts' citizens have a constitutional right to freedom from "excessive and unnecessary noise"(see Article 49 of the Massachusetts Constitution). I am convinced that phasing in Stage 3 aircraft and providing acoustical treatments to the most affected residences is not a final answer to the issue of noise mitigation. Given the extremely high level of concern expressed with noise impacts from Logan, last year's discouraging data regarding nighttime noise and cargo jet noise, and the pending review of the Airside Improvements FEIR, it is time to turn the general policy goals into additional noise mitigation commitments.

Stage 3 Operations. In the near term, the conversion of Logan's fleet from Stage 2 to Stage 3 aircraft and the gradual phasing out of hush-kitted stage 2 aircraft will lead to a decline in the total annual noise produced by Logan aircraft. However, in the longer term, both total annual noise and nighttime noise will increase as the number of flights in an all Stage 3 fleet is projected to rise (as noted above, nighttime noise increased in 1998). It is clear that large segments of the population already believe that noise from aircraft is excessive and needs to be reduced. For these reasons, the time has come to publicly pursue limitations on the number and timing of Stage 3 operations at Logan airport.

While federal law currently preempts Massport from restricting the number or scheduling of Stage 3 aircraft, it does allow the Federal Aviation Administration (FAA) to grant a waiver (under FAR Part 161) to an airport operator to impose restrictions. Massport should begin discussions now with FAA with the goal of restricting the number of aircraft overflights under Logan's flight paths, particular in the period between 10 p.m. and 7 a.m. The ESPR should detail what steps Massport, in conjunction with FAA, can take to bring about limitations in the number of Stage 3 operations. The ESPR should include discussion of the specific types of information needed to pursue a Part 161 waiver, including schedules and timetables for pursuing the waiver.

I recognize that it will not be an easy process to obtain a Part 161 waiver to allow Massport to impose stage 3 restrictions. In fact, the FAA has yet to grant such a waiver pursuant to part 161 (although has granted other types of waivers pursuant to Part 161). However, I am committed to making the pursuit of such a waiver a long term goal of the MEPA process. The 1999 ESPR will begin the process, but the issue will clearly require follow-up in subsequent Data Reports and ESPRs.[3]

Soundproofing. Many people living in acoustically treated houses have pointed out the limitations of acoustic treatments (they only work indoors with closed windows). While I recognize the limitations of the residential soundproofing program, I believe that the program is and will continue to be an important part of Massport's noise mitigation commitments. The proposed scope includes analysis of potential expansion of the soundproofing program. The ESPR should address the specific concerns outlined below.

Massport uses the federal criteria of residing within a 65 dB DNL contour for determining eligibility for residential acoustical treatment (the "soundproofing" program). However, it is clear that noise from aircraft overflights can create significant environmental impacts even for those who reside outside the 65 dB contour. (From the data in the technical appendix to the Airside DEIR, it is clear that thousands of residents are and will be exposed to noise just below 65 dB DNL as a result of airport operations.) Within the context of MEPA, Massport must show that it is taking all feasible methods to avoid, minimize, or mitigate impacts, not simply implementing a federal program to the maximum extent. The ESPR should investigate the feasibility of extending soundproofing eligibility beyond the 65 dB contour (regardless of federal funding criteria), and/or consider establishing a program of financial assistance (perhaps in the form of interest-free or low-interest loans) for residents within the 60-65 dB contour who wish to participate in the soundproofing program. On a similar note, several areas close to the airport do not fall within the 65 dB DNL contour, although these areas experience significant noise from taxiing aircraft and low frequency noise associated with activities on the airfield. The ESPR should consider noise mitigation for these areas as well.

Runway Use Allocation. Massport uses the Preferential Runway Advisory System (PRAS) to guide decisions regarding runway use allocation. The PRAS program is intended to more equitably distribute noise impacts among the various flight paths. Given the age of the PRAS program (it was developed in the 1970's, before the start of detailed MEPA review of Logan Airport under the GEIR process), changes in land use patterns and residential densities may have altered the validity of the assumptions under which the PRAS program was developed. The development of the PRAS program also predates the modern focus on environmental justice issues. The Community Advisory Committee to Massport recently withdrew its support of the

3 Developing limitations on Stage 3 operations will necessarily involve the federal government, and developing such limitations will inevitably require an act of political will. I therefore intend to work with members of the Congressional delegation to pursue this issue further with FAA.

PRAS program, citing some of these concerns. I am not convinced that a wholesale revamping of the PRAS program is desirable. However, the ESPR should discuss whether any updates of the PRAS goals are contemplated, and detail any mechanisms for ensuring that the program fulfills its objective of creating a more equitable noise distribution.

Sustainable Development

The construction associated with Logan 2000 and day-to-day operation of Logan Airport presents a host of opportunities for incorporating sustainable design elements and sustainable construction into project design, consistent with the goals of Executive Order 385. Sustainable design elements, over the course of the project design life, can both prevent Damage to the Environment and reduce operating costs to the proponent. Several recent Certificates on other state agency projects have included requirements for proponents to consider incorporating sustainable or "green" development principles into project design. The recent initiation of MEPA review for the Terminal A redevelopment offers an excellent opportunity to showcase sustainable design features at Logan Airport.

With this increasing focus on sustainable design, it is appropriate for Massport to include information on its own sustainable design program in the ESPR. The ESPR should include information on recycling (the City Environment Department has included some potentially useful suggestions on recycling) and toxics reduction at the airport. The ESPR should also discuss the potential for incorporating other sustainable design elements into airport operations and/or the ongoing rehabilitation and expansion of existing airport facilities, including but not limited to the following:

- optimization of natural day lighting, passive solar gain, and natural cooling;
- use of energy efficient HVAC and lighting systems, appliances and other equipment, and use of solar preheating of makeup air;
- favoring building supplies and materials that are non-toxic, made from recycled materials, and made with low embodied energy;
- provision of easily accessible and user-friendly recycling system infrastructure into building design; and
- development of an annual audit program for energy consumption, waste streams, and use of renewable resources.

Massport already incorporates some of these elements into its operation of the airport. The ESPR should summarize what steps Massport already takes, and how additional steps might increase environmental benefits.

MEPA Documents

The ESPR should include copies of all GEIR/Annual Update certificates issued since 1995 to provide context for reviewers. The ESPR should also include copies of all comments received on the 1998 Annual Update.

A cornerstone of MEPA review is making good information on environmental impacts readily available to the public. Particularly for the ongoing review of state facilities such as Logan, the internet offers an excellent medium through which information can be made accessible, and updated periodically. Therefore, as a model for comparable state agency filings, I ask that Massport make available on its web site the key summary information in the ESPR and each subsequent Data Report (starting with the 1998 Annual Update). Using the 1998 Annual Update as an example, I would expect the web site to contain, at a minimum, the text, tables, and graphics contained in the Executive Summary.

Circulation/Comments

At a minimum, Massport should circulate the ESPR to those parties who commented on the 1998 Annual Update, and it should send a Notice of Availability of the ESPR to its standard MEPA mailing list. The ESPR should respond to comments received on the 1998 Annual Update. Given the small volume of comments received, I recommend a response to comments format similar to the format used for the International Gateway FEIR.

December 10, 1999
Date

Bob Durand

Comments received:

11/10/99	Greater Boston Chamber of Commerce
11/19/99	Airport Impact Relief, Inc. (by Peter Koff)
11/22/99	Representative Robert DeLeo
11/22/99	The Association for Public Transportation
11/22/99	Massachusetts Sierra Club
11/22/99	National Association of Railroad Passengers
11/22/99	Department of Environmental Protection NERO
11/22/99	Metropolitan Area Planning Council
11/24/99	Boston Redevelopment Authority
11/24/99	Boston Environment Department
11/26/99	Lauri Webster
11/30/99	Boston Transportation Department
12/8/99	City of Chelsea (by Craighead Glick)

BAD/ASP/asp

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February 14, 2001

CERTIFICATE OF THE SECRETARY OF ENVIRONMENTAL AFFAIRS
ON THE
ENVIRONMENTAL STATUS AND PLANNING REPORT

PROJECT NAME	: 1999 Logan Airport Environmental Status and Planning Report (ESPR)
PROJECT MUNICIPALITY	: Boston / Winthrop
PROJECT WATERSHED	: Boston Harbor
EOEA NUMBER	: 3247
PROJECT PROPONENT	: Massachusetts Port Authority
DATE NOTICED IN MONITOR	: December 23, 2000

As Secretary of Environmental Affairs, I hereby determine that the 1999 Logan Airport ESPR (formerly known as the Logan Airport Generic Environmental Impact Report) **adequately and properly complies** with the Massachusetts Environmental Policy Act (G. L. c. 30, ss. 61-62H) and with its implementing regulations (301 CMR 11.00).

The environmental review process at Logan Airport has been structured to occur on two levels: airport-wide and project-specific. The ESPR has evolved from a largely retrospective status report on airport operations to a broader analysis that also provides a prospective assessment of long range plans. It has thus become (consistent with the objectives of the MEPA regulations) part of Massport's long range planning. In recognition of the increased role of planning in the GEIR process, the name of the document was changed to ESPR. The ESPR provides a "big picture" analysis of environmental impacts associated with current and anticipated levels of activities, and presents an overall mitigation strategy aimed at avoiding increases in such impacts. The ESPR analysis is supplemented by (and ultimately incorporates) the detailed analyses of project-specific EIRs. The ESPR is currently updated on a 5-year basis, with less detailed Environmental Data Reports (formerly Annual

Updates) filed in the years between ESPRs.

In general, the ESPR has responded to the scope. In particular, the ESPR contains a wealth of useful data on activity levels and impacts in 1999, and lays out a forecast for trends in future years. The "Status" portion of the document is solid. The ESPR documents the clear success of Massport's attempts at "regionalizing" air service in New England, as Logan's share of regional air traffic has declined to its lowest level (62%) in modern times. The rate of passenger growth at Logan continues to lag far behind other regional airports, most notably the airports in Providence, Rhode Island, and Manchester, New Hampshire. With the major exception of Worcester, all of the large commercial airports within the extended Boston metropolitan area are doing well at capturing their potential market shares.

In response to the slowing of the passenger growth rate at Logan, the ESPR has revised long-term passenger projections. It appears highly unlikely that the airport will achieve the previous "high end" estimate of 45 million passengers by 2010; in fact, the ESPR projects that the level of 37.5 million passengers will not be reached until 2015. I anticipate that the analysis of impacts and benefits for future projects that rely upon such projections, including the Airside Improvements, will be adjusted accordingly.

This Certificate will focus on several issues that have not been resolved in the ESPR. These issues are mostly related to the "Planning" portion of the document, and in particular, planning for mitigation of impacts projected in the ESPR. In particular, more work is needed on issues related to Air Quality, Noise, and Ground Transportation. With an EIR filing for the Airside Improvements Project (EOEA #10458) expected in the near future, planning for mitigation of airport impacts is particularly timely.

Air Quality

The ESPR describes a number of important improvements in airport-wide air quality. VOC emissions continue to decline, with a 9% between 1998 and 1999. I want to applaud Massport for the range of sustainability initiatives that are described in the ESPR. These include standards for the construction, design, and operation of new buildings and facilities at the airport. The conversion of the Ground Service Equipment (GSE) fleet to clean fuels is proceeding: timetables for such conversions are a key commitment in the recent MEPA reviews of the Delta and American Airlines terminal projects. Massport now offers reduced access

fees for clean-fuel vehicles. Ground power units and preconditioned air will be provided at all new or modified terminal gates.

I believe, however, that much more can be done to ensure that the airport reduces or minimizes its cumulative air pollution impacts. NO_x emissions have been rising since 1996, and the ESPR projects significant continued long-term increases in NO_x emissions through 2015. According to the ESPR only 11% of the total fleet of 1,728 GSE vehicles have been converted. The next update should project numerical targets for the phased conversion of the entire fleet, and describe potential implementation measures for achieving that goal.

In my Certificate on the Airside Improvements Draft EIR, I required Massport to examine an emissions-based landing fee system as a possible mitigation strategy for the NO_x emissions. Massport is now finalizing a multi-faceted NO_x program that may include assessment of landing fees based on emissions profiles, among other actions. I reiterate my earlier comments that a viable NO_x control program must be viewed as essential mitigation for airport air quality impacts. In a letter dated February 9, 2001, Massport has committed to publicly filing a detailed report describing its NO_x control program by March 31, 2001. A notice of availability of the report will be published in the *Environmental Monitor*.

Noise

Despite the introduction of an all-Stage 3 fleet, noise continues to represent a major concern of commenters. The ESPR projects general shrinkage of the noise contours by 2015. However, there will also be local changes for the worse. Residents of areas of Revere, Winthrop, and South Boston will experience higher levels of noise, with a dramatic jump in the number of Revere residents who will experience noise over 70 dBA DNL. Even in areas where noise is projected to decrease, noise from Logan Airport remains an important environmental issue, as shown by the comment letters that I have received from different neighborhoods.

The scope for the ESPR required Massport to analyze the feasibility of pursuing Part 161 waivers with the Federal Aviation Administration (FAA) to allow Massport to impose limitations on Stage 3 flights during the most sensitive hours (10 PM to 7 AM). I am not satisfied with the discussion (or lack thereof) of potential FAA waivers in the ESPR. The ESPR projects that nighttime flights will more than double by 2015. Many of

these flights occur in retrofitted Stage 2 aircraft (or meet Stage 3 specifications through administrative means), and are much noisier than true Stage 3 aircraft. However, since these flights technically meet Stage 3 specifications, Massport cannot impose any restrictions on them without a waiver from the FAA.

Given the importance of this unresolved issue, the next status report must address this issue in detail. The document should quantify the level of use of hushkitted aircraft as a percentage of total operations, and as a percentage of nighttime operations, and it should identify the degree to which hushkitted aircraft contribute to noise levels at Logan. The document should also report on FAA responses to different approaches to a Part 161 Waiver on hushkitted aircraft and/or nighttime Stage 3 flights.

Ground Transportation

As expected, the opening of the Ted Williams Tunnel has caused the transit/HOV mode share to level off after years of consistent growth. The implementation of the Airport Intermodal Transit Connector (AITC) between South Station and the Airport can help to resume growth in transit/HOV mode share. Massport's successful introduction of the DART service between South Station and Logan has demonstrated the strong demand for high-quality transit access from downtown. The Massachusetts Bay Transportation Authority (MBTA) will soon file an Annual Update on the Transitway project (EOEA #6826/11707), which will include analysis of the AITC. I am requiring that Massport work with the MBTA to provide information on the operational characteristics of the AITC in future Annual Updates, and to examine in conjunction with MBTA whether the use of larger 60-foot Transitway/AITC vehicles may encourage increased ridership, compared with previous projections.

I note that Massport is actively planning expansions of suburban parking for the Logan Express bus service. These expansions should cause significant new increases in ridership.

The MBTA has committed to initiating MEPA review of the Urban Ring by September 2001. I request that Massport work with the MBTA in planning the phased implementation of the Urban Ring to increase transit mode share for Logan Airport.

Mitigation Tracking

As Massport continues its modernization of the airport, the job

of keeping track of the various mitigation commitments that have emerged out of the ESPR, project specific MEPA reviews, and community agreements has become increasingly complicated. In the past, Massport has sponsored a series of community technical meetings (sometimes with EOEA representation) to discuss specific topics of concern with Logan projects. Several of the comments received have suggested a similar program of regular technical meetings. My staff will work with Massport in the upcoming months to address methods of improving mitigation tracking and community input.

February 14, 2001
Date

Bob Durand, Secretary

Comments received:

1/27/01	Joseph Felzani
2/5/01	Carl Shalachman
2/7/01	Representative Robert DeLeo
2/7/01	Representative Anthony Petruccelli
2/7/01	Thomas Ambrosino, Mayor of Revere, and others
2/7/01	Representatives DeLeo, Reinstein, Petruccelli, and others
2/7/01	Air Inc. (Engel & Schultz)
2/7/01	Gail Miller
2/8/01	Community Advisory Committee to Massport
2/8/01	Point of Pines Beach Association
2/8/01	Aircraft Noise Action Committee
2/8/01	Lauri Webster
2/12/01	Boston Environment Department
Various dates	Petitions against airport expansion

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February 15, 2002

CERTIFICATE OF THE SECRETARY OF ENVIRONMENTAL AFFAIRS
ON THE
2000 LOGAN AIRPORT ENVIRONMENTAL DATA REPORT

PROJECT NAME	: 2000 Environmental Data Report
PROJECT MUNICIPALITY	: Boston / Winthrop
PROJECT WATERSHED	: Boston Harbor
EOEA NUMBER	: 3247
PROJECT PROPONENT	: Massachusetts Port Authority
DATE NOTICED IN MONITOR	: December 26, 2001

As Secretary of Environmental Affairs, I hereby determine that the Environmental Data Report submitted on this project **adequately and properly complies** with the Massachusetts Environmental Policy Act (G. L. c. 30, ss. 61-62H) and with its implementing regulations (301 CMR 11.00).

The environmental review process at Logan Airport has been structured to occur on two levels: airport-wide and project-specific. The Environmental Status and Planning Report (ESPR) has evolved from a largely retrospective status report on airport operations to a broader analysis that also provides a prospective assessment of long range plans. It has thus become (consistent with the objectives of the MEPA regulations) part of Massport's long range planning. In recognition of the increased role of planning in the GEIR process, the name of the document was changed to ESPR. The ESPR provides a "big picture" analysis of environmental impacts associated with current and anticipated levels of activities, and presents an overall mitigation strategy aimed at avoiding increases in such impacts. The ESPR analysis is supplemented by (and ultimately incorporates) the detailed analyses and mitigation commitments of project-specific EIRs. The ESPR is currently updated on a 5-year basis, with much less detailed Environmental Data Reports (formerly Annual Updates) filed in the years between ESPRs. The 2000 EDR is the subject of this Certificate.

In general, the EDR has fulfilled its purpose of providing a

"snapshot" of year 2000 passenger and impact levels at Logan Airport. Although passenger levels increased by 1.3% over 1999 levels, the number of flights decreased by 1.4%. Most environmental parameters showed improvement in calendar year 2000 - including levels of nitrogen oxide (NOx), total numbers of people exposed to high noise levels (65 and 70 dB), and ridership of high occupancy vehicles (HOVs). However, as discussed below, I am requiring substantive discussion in the next annual update on issues relating to noise mitigation, ground transportation, and mitigation commitments.

Noise Impacts

Minimizing and mitigating noise impacts remains a key concern both of this office and the commenters. As I have discussed at length in previous Certificates, the structure of federal law makes mitigation for noise impacts in an all-Stage 3 fleet a challenging and lengthy undertaking. However, given predictions of a dramatic increase in the number of nighttime flights through 2015, and the existing levels of impact from Stage 3 (and hush-kitted Stage 2) aircraft, I remain deeply concerned with this issue. Once again, the ESPR/EDR discussion dismisses the possibility of a Part 161 process with the Federal Aviation Administration as a method of developing enforceable mitigation for aircraft noise, particularly during the most sensitive nighttime periods. This is the biggest shortcoming of the EDR. I expect a much fuller discussion in the 2001 EDR on alternative measures to reduce night-time noise and use of hushkitted aircraft.

Air Quality Initiative

The 2000 ESPR notes, but does not discuss in detail, the Air Quality Initiative (AQI, more familiarly known as the "NOx cap") to which Massport committed in March 2001. The next document, and all future filings, shall address how Massport is satisfying the AQI commitments. In particular, the 2001 EDR should quantify the use of alternative fuel vehicles within the ground service equipment fleet, and it should contain a specific schedule and process for setting in place the system of tradable emissions credits.

Ground Transportation

The 2001 EDR shall respond to the comments and previous MEPA certificates asking for clarification of the definition of HOVs. I suggest a breakdown among different types of scheduled and unscheduled HOV services, to allow commenters to better understand the data and its implications.

Amtrak's Acela service to New York completed its first full year of operation in 2001. The diversion of New York inter-city trips to train is a key part of Massport's overall transportation strategy. The 2001 EDR should compare actual train usage compared with previous projections, and discuss any available data on actual diversionary effects of the service.

Future Activity Levels and Status of Mitigation Measures

While the EDR reports primarily on year 2000 data, Massport includes some preliminary analysis of the impact of September 11 events on Logan Airport. In the short term, I expect that impact levels will experience a significant drop, correlating to the sharp decline in passenger and operation levels. Long term impacts may prove harder to predict. The 2001 EDR should discuss current information on changes in passenger and flight levels, and the potential effect on future projections.[1]

I recognize that the events of September 11 have contributed to short-term financial difficulties at Massport. However, regardless of current finances, the MEPA statute requires proponents to honor mitigation commitments made in previous filings. These commitments may take the form of project-specific Section 61 Findings, as well as more general mitigation measures that have emerged from the ESPR process. A material change to an existing Section 61 commitment would require, at a minimum, a Notice of Project Change to the project-specific file from which the commitment emerged. During the subsequent MEPA review, I would expect development of substantially equivalent mitigation. The 2001 EDR needs to fully document any current or proposed changes to previous mitigation commitments, the sources of such commitments, and the potential environmental impacts of the changes.

Response to Comments

Several comments have raised concerns with the format of this year's response to comments section. For the 2001 EDR, Massport should return to the response format used in previous documents. The 2001 EDR should respond fully to each of the concerns raised in the comments on the 2000 EDR, including any references to previous comments that remain relevant.

1 As I have noted on other occasions, projections of future impacts at Logan are appropriately linked to specific levels of activities, and not to specific years.

February 15, 2002
Date

Bob Durand, Secretary

Comments received:

02/08/02	AIR Inc. (Engel & Schultz)
02/08/02	Rep. Anthony Petrucelli
02/08/02	Boston Environment Department
02/08/02	Ronald Fama
02/08/02	Boston Public Health Commission
02/11/02	AIR Inc. (Engel & Schultz)
02/11/02	Stephen Kaiser
02/11/02	Rep. Kathi-Anne Reinstein
02/11/02	Boston Redevelopment Authority
02/12/02	Department of Environmental Protection NERO
02/12/02	Boston Transportation Department
02/13/02	Metropolitan Area Planning Council

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February 14, 2003

CERTIFICATE OF THE SECRETARY OF ENVIRONMENTAL AFFAIRS
ON THE
2001 LOGAN AIRPORT ENVIRONMENTAL DATA REPORT

PROJECT NAME	:	2001 Environmental Data Report
PROJECT MUNICIPALITY	:	Boston / Winthrop
PROJECT WATERSHED	:	Boston Harbor
EOEA NUMBER	:	3247
PROJECT PROPONENT	:	Massachusetts Port Authority
DATE NOTICED IN MONITOR	:	January 8, 2003

As Secretary of Environmental Affairs, I hereby determine that the Environmental Data Report submitted on this project **adequately and properly complies** with the Massachusetts Environmental Policy Act (G. L. c. 30, ss. 61-62H) and with its implementing regulations (301 CMR 11.00).

The environmental review process at Logan Airport has been structured to occur on two levels: airport-wide and project-specific. The Environmental Status and Planning Report (ESPR) has evolved from a largely retrospective status report on airport operations to a broader analysis that also provides a prospective assessment of long range plans. It has thus become (consistent with the objectives of the MEPA regulations) part of Massport's long range planning. In recognition of the increased role of planning in the GEIR process, the name of the document was changed to ESPR. The ESPR provides a "big picture" analysis of environmental impacts associated with current and anticipated levels of activities, and presents an overall mitigation strategy aimed at avoiding increases in such impacts. The ESPR analysis is supplemented by (and ultimately incorporates) the detailed analyses and mitigation commitments of project-specific EIRs. The ESPR is currently updated on a 5-year basis, with much less detailed Environmental Data Reports (formerly Annual Updates) filed in the years between ESPRs. The 2001 EDR is the subject of this Certificate.

In general, the EDR has fulfilled its purpose of providing a "snapshot" of year 2001 passenger and impact levels at Logan Airport. Most environmental parameters showed marked improvement in calendar year 2001, corresponding with a sharp drop in passenger and flight levels following the tragic events of September 11 and its effects on the airline industry (the EDR shows that the September 11 events accelerated a process of fewer passengers in calendar year 2001). Compared to the previous year, passenger levels dropped 11.7% and operations declined 5.1%. The EDR documents an associated decline in air emissions, noise, and demand for ground transportation.

The EDR reports on a Massport board vote (actually taken in calendar year 2002) reaffirming Massport's commitment to the Air Quality Initiative (AQI). In the short term, the drop in air emissions associated with declining numbers of operations has changed the point at which the triggers in the AQI are projected to be reached. Massport now anticipates that NO_x levels will not exceed the 1999 benchmark level (conservatively recalculated in the EDR at 2,235 tons per year) until 2007, with much smaller exceedances of the benchmark level through 2015[1]. Despite the smaller projected increases, I wish to reaffirm the full support of EOEA for the AQI. I consider the AQI to be a critical component of Massport's air quality mitigation.

Mitigation of noise impacts remains a key concern both of this office and the communities around Logan Airport. The EDR reports on hopeful trends away from the use of hushkitted aircraft. The increasing use of regional jets (RJs) has also tended to improve the noise situation under flight paths. However, given ESPR predictions of an eventual increase in the number of nighttime flights above current levels, and the existing levels of impact from Stage 3 (and hush-kitted Stage 2) aircraft, I remain deeply concerned with this issue. As previous Certificates have addressed in detail, the structure of federal law makes mitigation for noise impacts in an all-Stage 3 fleet a challenging and lengthy undertaking. It is clear that much work remains to be done in fully mitigating noise impacts from Logan Airport, and I encourage Massport to work with the Federal Aviation Administration to develop additional mitigation for noise impacts.

1 I note that the use of regional jets continued to increase sharply in 2001. Regional jets produce greater amounts of NO_x per passenger than traditional jets. I fully endorse Massport's efforts to advocate for reduced NO_x emissions from jet engines.

I note the request from the City of Boston to make available data from the noise monitors in the days immediately following September 11, 2001. Since the airport was not in commercial service for several days, the noise data from this period should contain valuable information about background noise conditions. Massport should make noise data in the immediate aftermath of September 11 available as part of the 2002 EDR.

The noise contours showed general improvement in 2001, corresponding to decreased number of operations, and the trends away from hushkitted aircraft and towards regional jets. Nonetheless, the number of people exposed to noise between 70 and 75 dBA DNL increased, probably as a result of model refinements and increased use of Runway 22R. Massport should ensure that any residences newly included in the 70-75 dBA contour receive residential soundproofing as soon as feasible, rather than waiting, as proposed in the EDR, for completion of the Airside Project.

The EDR reports on a decrease in overall HOV ridership that closely matches the decline in annual passengers, although the Logan Express service experienced a smaller relative decline post-September 11. Employee usage of Logan Express continues to increase, despite the decreased activity levels of the airport as a whole. The issue of ground transportation (and coordination among transportation agencies) remains a key issue for the ESPR process.

Massport has requested that I reconsider the need for formal MEPA review of the Logan EDRs. The EDR provides a valuable "snapshot" of Logan activities for a given calendar year. However, I am less convinced that formal MEPA review of EDRs (with issuance of a Certificate) is the most effective use of the resources of either EOEA or Massport. In recent years, the review of EDRs has generated very little interest among reviewers and very few written comments.

To fully evaluate Massport's request, I am requiring Massport to file a Notice of Project Change (NPC) to the Logan ESPR file that would propose a substitute mechanism for timely review of EDR data. I will review the NPC and public comments, and consider appropriate modifications to the EDR process following NPC review, provided that any proposed substitute mechanism should ensure the following conditions are met:

- The public would still have timely and convenient access to environmental data substantially equivalent to the data now provided in the EDR[2];
- The public would still have an opportunity to provide feedback on environmental data;
- Massport would still file the ESPR for formal MEPA review every five years; and
- The public would have formal input into development of the ESPR scope.

February 14, 2003
Date

Ellen Roy Herzfelder

Comments received:

01/28/03 Stephen Kaiser
02/10/03 Boston Redevelopment Authority
02/10/03 City of Boston Environment Department
02/11/03 Representative Anthony Petruccelli

BAD/ASP/asp

2 I have again received comments noting the significant lapse of time between the subject year of the EDR and the filing of the EDR for MEPA review. I strongly encourage Massport to take the opportunity provided by potential structural changes to the EDR process to consider methods of making relevant data available to reviewers in a more timely fashion.

1.5

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ELLEN ROY HERZFELDER
SECRETARY

11/14/03 File Copy

November 13, 2003

CERTIFICATE OF THE SECRETARY OF ENVIRONMENTAL AFFAIRS
ON THE
2002 LOGAN AIRPORT ENVIRONMENTAL DATA REPORT

PROJECT NAME	: 2002 Environmental Data Report
PROJECT MUNICIPALITY	: Boston / Winthrop
PROJECT WATERSHED	: Boston Harbor
EOEA NUMBER	: 3247
PROJECT PROPONENT	: Massachusetts Port Authority
DATE NOTICED IN MONITOR	: October 7, 2003

As Secretary of Environmental Affairs, I hereby determine that the Environmental Data Report submitted on this project **adequately and properly complies** with the Massachusetts Environmental Policy Act (G. L. c. 30, ss. 61-62H) and with its implementing regulations (301 CMR 11.00).

The environmental review process at Logan Airport has been structured to occur on two levels: airport-wide and project-specific. The Environmental Status and Planning Report (ESPR) has evolved from a largely retrospective status report on airport operations to a broader analysis that also provides a prospective assessment of long range plans. It has thus become (consistent with the objectives of the MEPA regulations) part of Massport's long range planning. The ESPR provides a "big picture" analysis of environmental impacts associated with current and anticipated levels of activities, and presents an overall mitigation strategy aimed at avoiding increases in such impacts. The ESPR analysis is supplemented by (and ultimately incorporates) the detailed analyses and mitigation commitments of project-specific EIRs. The ESPR is currently updated on a 5-year basis, with much less detailed Environmental Data Reports filed in the years between ESPRs. The 2002 EDR is the subject of this Certificate.

In general, the EDR has fulfilled its purpose of providing a "snapshot" of year 2002 passenger and impact levels at Logan Airport. Most environmental parameters showed significant improvement in calendar year 2002, as the aftermath of the

September 11, 2001 terrorist attacks and economic conditions combined to depress the numbers of both passengers and aircraft operations. The drop in passenger and flight activity levels has caused a significant drop in associated air emissions, vehicular traffic, and noise. I anticipate that these impacts will ultimately begin to increase again as activity levels rise.

As always, this office remains committed to evaluating and addressing the cumulative impacts of Logan operations on the surrounding communities. The EDR reaffirms Massport's commitment to the Air Quality Initiative, a key program designed to mitigate the cumulative air quality impacts of airport operations. The 2002 EDR showed a general and significant improvement in the cumulative noise impacts from the airport. The Cumulative Noise Index now stands at its lowest level in years, and has fallen 1.5 dB since 2001. The noise contours also tended to shrink significantly in 2002. While these trends may prove temporary, they do provide a welcome measure of relief from airport-related noise impacts.

I remain concerned with the use of "hushkitted" stage 2 aircraft. These aircraft, while technically meeting the stricter stage 3 noise requirements, are significantly noisier than true stage 3 aircraft. Hushkitted aircraft comprised 7% of operations at Logan in 2002 but were responsible for 16% of aircraft noise. I once again urge Massport to work with the Federal Aviation Administration on this issue, and the wider issue of minimizing noise from an all-stage 3 fleet.

The overall level of HOV/transit ridership declined by 8.3% in 2002, slightly more than the 7.3% drop in passengers. However, Logan Express ridership posted an overall increase of 5.4%, as a slight drop in ridership by passengers was more than offset by a large increase in use by airport employees. Increased employee use of Logan Express appears to represent a promising method of mitigating ground transportation impacts from airport operations. Massport should continue to aggressively promote Logan Express service, to both passengers and airport employees. Massport should also continue to coordinate with the Massachusetts Bay Transportation Authority to ensure that transit ridership to the airport increases, especially after the scheduled improvements to Airport Station are implemented.

In the 2001 EDR, Massport asked that I reconsider the need for formal MEPA review of the EDRs. While I was open to consider this request, Massport has subsequently decided against asking for any modifications to the current EDR review process.

Therefore, Massport should file the next EDR (covering operations for the 2003 calendar year) in calendar year 2004. The 2003 EDR should also include Massport's proposed scope for the next ESPR, due in calendar year 2005. The proposed scope will thus receive public review, and I will have the benefit of public comment, prior to my issuance of a binding ESPR scope. Massport should consider the comments received on the current and prior EDRs when developing its proposed scope for the ESPR.

November 13, 2003
Date

Ellen Roy Herzfelder

Comments received:

11/06/03 Boston Redevelopment Authority
11/07/03 Boston Environment Department
11/07/03 Department of Environmental Protection NERO
11/07/03 Massachusetts Highway Department
11/10/03 The Boston Harbor Association
11/10/03 Metropolitan Area Planning Council
11/10/03 Department of Environmental Protection Boston
11/12/03 Federal Aviation Administration

ERH/ASP/asp

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September 10, 2004

CERTIFICATE OF THE SECRETARY OF ENVIRONMENTAL AFFAIRS ON THE 2003 LOGAN AIRPORT ENVIRONMENTAL DATA REPORT

PROJECT NAME	: 2003 Environmental Data Report
PROJECT MUNICIPALITY	: Boston / Winthrop
PROJECT WATERSHED	: Boston Harbor
EOEA NUMBER	: 3247
PROJECT PROPONENT	: Massachusetts Port Authority
DATE NOTICED IN MONITOR	: July 10, 2004

As Secretary of Environmental Affairs, I hereby determine that the Environmental Data Report submitted on this project **adequately and properly complies** with the Massachusetts Environmental Policy Act (G. L. c. 30, ss. 61-62H) and with its implementing regulations (301 CMR 11.00).

The environmental review process at Logan Airport has been structured to occur on two levels: airport-wide and project-specific. The Environmental Status and Planning Report (ESPR) has evolved from a largely retrospective status report on airport operations to a broader analysis that also provides a prospective assessment of long range plans. It has thus become (consistent with the objectives of the MEPA regulations) part of Massport's long range planning. The ESPR provides a "big picture" analysis of environmental impacts associated with current and anticipated levels of activities, and presents an overall mitigation strategy aimed at avoiding increases in such impacts. The ESPR analysis is supplemented by (and ultimately incorporates) the detailed analyses and mitigation commitments of project-specific EIRs. The ESPR is currently updated on a 5-year basis, with much less detailed Environmental Data Reports (formerly Annual Updates) filed in the years between ESPRs. The 2003 EDR is the subject of this review. In addition, the Scope for the 2004 ESPR is provided in this Certificate.

In general, the EDR has fulfilled its purpose of providing a "snapshot" of year 2003 passenger and impact levels at Logan Airport. While passenger levels increased slightly in 2003 from 2002 levels, total aircraft operations continued to decrease, with 2003 levels 5% below 2002 levels. Accordingly, all environmental parameters showed improvement in calendar year 2003.

Air emissions were all lower in 2003 than 2002; volatile organic compounds (VOCs) decreased 10 percent, oxides of nitrogen (NOx) emissions decreased 10 percent, and carbon monoxide (CO) decreased 7 percent. NOx emissions were 33 percent below the 1999 benchmark established under the Air Quality Initiative.

According to the EDR, the noise environment also improved in 2003. Counts of population exposed to levels of noise in excess of 64 db DNL decreased by more than 13 percent and the 2003 Cumulative Noise Index was at its lowest level in over a decade.

The majority of comments received on the EDR focused on noise related issues, including measurement of noise, modeling of noise contours, and noise abatement. In addition to responding to these comments, the 2004 ESPR and future EDRs should also report on the progress and findings of the Massport Overflight Study and other refinements to noise tracking and abatement efforts, as further described in the Scope for the 2004 ESPR below.

Scope for the 2004 ESPR

The 2004 ESPR should follow the general format of the 1999 ESPR, presenting major policy discussions and an overview of the role of Logan Airport in the regional planning context. This should be followed by a status report on Massport's planning initiatives, projects, and mitigation. The ESPR should include an Executive Summary and Introduction, similar to previous ESPRs and EDRs. Massport must provide necessary background information to allow reviewing agencies and the public to understand the environmental policies and planning which form the context of the environmental reporting, technical studies, and environmental mitigation initiatives at Logan Airport.

The technical studies in the 2004 ESPR will include reporting on and analysis of key indicators of airport activity levels, the regional transportation system, ground access, noise, air quality, environmental management, and project mitigation

tracking.

Airport Activity Levels

The ESPR must include a chapter on Airport Activity Levels to report on airport activity levels, including information on Aircraft operations, including fleet mix; passenger activity levels; cargo and mail operations. This chapter will also report on Massport's forecasts that will become the basis for the planning and impact sections that follow and for Massport's strategic planning initiatives over the next few years. Past forecasts were based on low, medium, and high passenger activity levels (29 million air passengers, 37.5 million air passengers, and45 million air passengers). New forecasts will be based on the forecasts for 2020 being developed for the New England Regional Airport System Plan (NERASP) study. This chapter will update the aircraft operations and passenger activity forecasts, and will provide a discussion of analysis methodologies and assumptions, including anticipated fleet mix changes and other trends in the aviation industry. The section will also report on the following:

- Compare 2004 operations to historic trends (to 1990) and forecasts for the planning horizon year (2020).
- Report on national aviation trends and compare to trends at Logan Airport.
- Present updated forecasts of Logan Airport's passenger volume, aircraft operations, and fleet mix.
- Compare forecast activity levels to historic trends, prior Logan Airport forecasts, and FAA forecasts for Logan Airport and the US Industry.

Airport Planning

This section will describe the status of planning initiatives and projects through the planning horizon year (2020) for the Terminal Area; Airside Area; Service and Cargo Areas; and Edge Buffers and Landscaping. The Airport Planning Chapter also will report on the status of public works projects implemented by other agencies within the boundaries of Logan Airport. These include the Central Artery/Tunnel Project of the Massachusetts Highway Department, and the Massachusetts Bay Transportation Authority's Airport Station.

Regional Transportation Context

The 2004 ESPR will describe Logan Airport's role in the region's intercity transportation system by reporting on the following:

Regional Airports

- 2004 regional airport operations, passenger activity levels, and schedule data within an historical context.
- Detailed status report on the New England Regional Airport System Plan (NERASP) study including aviation activity forecasts for 2020, and the results of airport passenger surveys.
- Status of plans and new improvements as provided by the regional airport authorities.
- Ground access improvements to the regional airports.
- The role that Worcester and Hanscom play in the regional aviation system and Massport's efforts to promote these airports.

Regional Transportation System

- Massport's efforts in strengthening the regional transportation system.
- Massport's cooperation with other transportation agencies to promote efficient regional highway and transit operations.
- Report on metropolitan and regional rail initiatives and ridership, including the Silver Line, Urban Ring, Down-easter, and Northeast Corridor High Speed Service.
- Report on the status of completion of the Central Artery/Tunnel Project.

The chapter should also include a forecast of the region's aviation intercity needs, based on the NERASP, Logan Airport's role in those needs, as well as the ability of the region's facilities to meet those needs.

Ground Transportation

The chapter will report on 2004 conditions and provide a comparison of 2004 findings to previous years for the following ground transportation indicators:

- High occupancy vehicle (HOV) ridership
- Summary of Air Passenger survey (2003) and Employee survey (2001) and mode shares with an historical context

- TMA membership and services
- Traffic volumes
- On-airport vehicle miles traveled (VMT)
- Parking demand and management
- Ground transportation management plan

The chapter will present a discussion of analysis methodologies and assumptions for future year conditions for the planning horizon year (2020) for Traffic volumes, On-airport Vehicle miles traveled (VMT)and Parking demand.

In addition, this chapter will present a discussion of the following topics:

Definition of high occupancy vehicle (HOV) including:
- Unscheduled HOV service and the segment of these that carry single passengers.
- HOV services that are not reported on in the ESPR/EDR, including MBTA buses, Blue Line passengers at Wood Island Station, inbound scheduled services, and private automobile or taxi trips that carry more than one passenger.
- Massport's target HOV mode share.
- Non-Airport through-traffic.
- Massport's cooperation with other transportation agencies to increase transit ridership to and from Logan Airport via the Blue Line, Urban Ring, and Silver Line Extension (Airport Intermodal Transit Connector).
- Potential service expansion of Logan Express and efforts to increase capacity and usage.
- Progress on enhancing water transportation to and from Logan Airport.
- Progress on rental car consolidation.
- Status of parking projects at Logan Airport.
- Strategies for enhancing services and increasing employee membership in the Logan Airport TMA.

Noise

This chapter should begin with an overview of the environmental regulatory framework affecting aircraft noise, the changes in aircraft noise, the methodologies used to track noise, and any changes in noise modeling. The information provided in this chapter will build upon the findings of the Boston Logan Overflight Noise Study, currently under development and discussed

further below.

The chapter must report on 2004 conditions and a comparison to previous years for the following noise inputs:

- Fleet Mix, including Stage II, Recertified (Hushkitted) Stage III, newly manufactured Stage III, and any qualifying Stage IV aircraft.
- Nighttime operations.
- Runway Utilization
- PRAS compliance
- Flight Tracks, including a discussion of the new StARS radar and consolidation of the Boston TRACON at Merrimac.

The chapter must report on 2004 conditions and a comparison to previous years for the following indicators:
- Day-Night Level (DNL) noise contours
- Population counts
- Measured vs Modeled Noise Values
- Cumulative Noise Index (CNI)
- Times-Above a Given Threshold
- Dwell and Persistence
- Flight track monitoring

The chapter must report on the following noise abatement efforts:

- Improvements to the noise monitoring system
- Procedure and requirements for sound insulation and sound insulation progress
- Installation and Capabilities of Massport's new Noise and Operations Monitoring System
- Noise management plan
- FAA's Centerfield Taxiway Supplemental Study
- Summary of the Boston Logan Overflight Noise Study
- Summary of PRAS updates
- Noise impacts by airline
- Percent of airline operations in newly manufactured Stage III aircraft

This chapter must present a discussion of analysis methodologies and assumptions, including fleet mix and runway use assumptions, and report on future year conditions (2020) for the following noise indicators:

- Runway utilization
- Day-Night Level (DNL) noise contours
- Population counts

This chapter must also present a discussion of the following topics:

- Feasibility of extending sound insulation eligibility beyond the 65 dB contour and/or financial assistance for sound insulation
- Noise mitigation for those experiencing noise from taxiing aircraft and low frequency airfield noise.

At the public meeting held on August 24, 2004, Massport stated that the current Boston Logan (and Hanscom Field) Noise Monitoring System hardware and software may be upgraded. The Noise Monitoring System provides the data needed for researching and responding to community related noise complaints, including aircraft flight track, aircraft type, and runway use data for reporting purposes. These data also are used as inputs to the FAA INM model for generating noise contours. The System includes a series of permanent, field microphones (36 in total including 6 at Hanscom Field) strategically located around the two airports. The microphones measure actual aircraft noise events. The System is maintained continuously and annually calibrated to meet industry standards. However, Massport has recognized that the existing computer hardware and software may be in need of upgrading. Given the critical role a noise monitoring system plays in providing aircraft noise monitoring and reporting information, I am requiring Massport report on its efforts to upgrade the current noise monitoring system, and describe any expected improvements in capabilities as a result of installing a new system.

In its Record of Decision approving the construction of Runway 14/32, the FAA called for an Overflight Study to review and, where possible, enhance current Air Traffic Control procedures with the goal of reducing noise from aircraft overflights. The study is a collaborative effort involving the FAA, Massport and the Community Advisory Committee (CAC). I am directing that Massport provide an update on the progress of the Overflight Study in the 2004 ESPR and in future EDRs. These annual updates should include the status of the study, accomplishments and specifics on various alternatives being considered, as well as a summary of findings/recommendations.

Air Quality

This chapter should begin with an overview of the environmental regulatory framework affecting aircraft emissions, changes in aircraft emissions, and the changes in air quality modeling. The chapter will discuss analysis methodologies and assumptions and report on 2004 conditions and a comparison to previous years for the following on-airport air quality indicators:

- Emissions Inventory for Carbon Monoxide (CO)
- Emissions Inventory for Oxides of Nitrogen (Nox)
- Emissions Inventory for Volatile Organic Compounds (VOCs).
- Emissions Inventory for PM (if the latest available and approved FAA EDMS model includes PM)
- Nitrogen Dioxide (NO2) monitoring
- Nox emissions by airline

The chapter will report on the following air quality initiatives (AQI) for 2004:

- Air Quality Initiative Tracking
- Massport's and Tenants' Alternative Fuel Vehicle Programs

This chapter will present a discussion of analysis methodologies and assumptions and report on future year conditions (2020) for the following on-airport air quality indicators:

- Emissions Inventory for Carbon Monoxide (CO)
- Emissions Inventory for Oxides of Nitrogen (Nox)
- Emissions Inventory for Volatile Organic Compounds (VOCs)
- Emissions Inventory for Particulate Matter (PM) (if available in EDMS model).

This chapter also will present a discussion of the following topics:

- Status of the Air Quality Initiative including projections for NOx emissions, credits, and deficits through the planning horizon year (2020)
- Status of emission credit trading market
- Alternative Fuel Vehicle Program including numeric targets for conversion and potential implementation measures.
- Progress on the national international levels to decrease

air emissions

In the spring of 2004, the Commonwealth issued the first Massachusetts Climate Protection Plan, which represents an initial step to reduce emissions of greenhouse gases (GHGs) and to improve energy efficiency in the workplace. Massport has agreed to take an active role in several of the Climate Action teams recently established to monitor and facilitate implementation of the Plan. In the 2004 ESPR and forthcoming EDRs, Massport must report on the progress of aviation/airport elements of the Plan and steps Massport is taking towards enhancing the tracking and reporting of airport-related GHG emissions and measures to reduce GHG emissions beyond those already in place. The results of such GHG emissions tracking must be reported in the 2004 ESPR and future EDRs, as required under the Massachusetts Climate Protection Plan.

Environmental Management

This chapter will report on the activities of Massport's Environmental Management Unit in meeting the state's environmental regulatory requirements. It should begin with an overview of the environmental regulatory framework and reports on 2004 conditions in comparison to previous years for the following environmental management indicators:

- National Pollutant Discharge Elimination System (NPDES) Permit monitoring results
- Jet fuel usage and spills
- MCP Activities
- Tank Management
- Update on the environmental management plan

This chapter also will present a discussion of the following topics:

- Fuel spill prevention
- Future stormwater management improvements
- Future tank management activities

Sustainability Initiatives

This Chapter will present Massport's on-going and upcoming sustainability initiatives at Logan Airport, including the following:

- Massport's Environmental Policy
- Massport's Sustainability Plan
- Massport's ISO 14,000 Certification
- Recycling
- Toxics Reduction
- Sustainable design elements in airport operations
- Sustainable design elements in airport facilities
- Energy and waste stream audit programs

Project Mitigation Tracking

This chapter will report on the status of mitigation commitments for specific Massport and tenant projects at Logan Airport that have undergone MEPA review and have commenced construction[1]. The mitigation commitments were made in the Section 61 Findings for the following projects:

- West Garage/Central Garage
- International Gateway
- Jet Fuel Storage and Distribution System
- Runway Safety Ends Project
- Replacement Terminal A
- American Airlines Terminal B/Massport Satellite FIS Facility Improvements Project
- Logan Airside Improvements Planning Project

This chapter should identify any changes to mitigation commitments and the process that will be engaged to accommodate any adjustments. I remind Massport that any material change to a Section 61 mitigation commitment would likely be considered a material change for MEPA purposes and require the formal filing and public review of a Notice of Project Change. I note that the MEPA Certificate on the Logan Airside Improvements Planning Project (EOEA #10458) required that the Section 61 Findings be revised to incorporate "any further commitments within MEPA jurisdiction that may arise under the federal review process."

1 I note that at the August 24th public meeting and in a subsequent comment, the issue of non-compliance with FAA's 1996 Record of Decision Regarding Jet Departures from Runway 27 was raised. While this appears to be a valid concern, this project was not reviewed under MEPA and is not a legally enforceable commitment under state law. By copy of this certificate and comments received, I am referring this to FAA and encourage them to address this issue.

The 2004 ESPR should report on Massport's progress in meeting this obligation and identify any additions to the Section 61 Findings. A separate copy of any updated Section 61 Findings should be forwarded to the MEPA office for the project file (EOEA #10458). This chapter should also identify projects for which mitigation is complete.

Appendices/MEPA Documentation/Response to Comments

The ESPR must include a copy of this Certificate, and a copy of each comment letter received on the 2003 EDR. Individual responses to issues raised in this Certificate on the 2003 EDR must be provided. Individual responses to the issues raised in comments received must also be provided. In particular, Massport should provide a thorough examination of issues raised regarding individual noise monitoring locations, noise measurement and modeling, and noise abatement. Massport should consult with individual commentors where necessary.

A distribution list for the 2004 ESPR (indicating those receiving documents, CDs, or Notices of Availability) should be provided in the document. This section must also include copies of all GEIR/Annual Update Certificates issued since 1995 to provide context for reviewers. Supporting technical appendices should be provided as necessary.

September 10, 2004
Date

Ellen Roy Herzfelder
Ellen Roy Herzfelder, Secretary

Comments received:
- Boston Redevelopment Authority - 8/20/04
- MAPC - 8/20/04
- Stephen Lathrop - 8/26/04
- John Stewart - 7/29 and 8/26/04
- Boston Environment Department - 8/31/04

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STEPHEN R. PRITCHARD
SECRETARY

August 16, 2006

CERTIFICATE OF THE SECRETARY OF ENVIRONMENTAL AFFAIRS ON THE ENVIRONMENTAL STATUS AND PLANNING REPORT

PROJECT NAME	: 2004 Logan Environmental Status and Planning Report
PROJECT MUNICIPALITY	: Boston / Winthrop
PROJECT WATERSHED	: Boston Harbor
EOEA NUMBER	: 3247
PROJECT PROPONENT	: Massachusetts Port Authority
DATE NOTICED IN MONITOR	: June 7, 2006

As Secretary of Environmental Affairs, I hereby determine that the Environmental Status and Planning Report submitted on this project **adequately and properly complies** with the Massachusetts Environmental Policy Act (G. L. c. 30, ss. 61-62H) and with its implementing regulations (301 CMR 11.00).

The environmental review process at Logan Airport has been structured to occur on two levels: airport-wide and project-specific. The Environmental Status and Planning Report (ESPR) has evolved from a largely retrospective status report on airport operations to a broader analysis that also provides a prospective assessment of long-range plans. It has thus become (consistent with the objectives of the MEPA regulations) part of Massachusetts Port Authority's (Massport) long range planning. The ESPR provides a "big picture" analysis of environmental impacts associated with current and anticipated levels of activities, and presents an overall mitigation strategy aimed at avoiding increases in such impacts. The ESPR analysis is supplemented by (and ultimately incorporates) the detailed analyses and mitigation commitments of project-specific EIRs. The ESPR is currently updated on a five-year basis, with much less detailed Environmental Data Reports filed in the years between submission of the ESPRs. The 2004 ESPR is the subject of this Certificate.

Background

In 1979, the Secretary of the Executive Office of Environmental Affairs (EOEA) issued a Certificate requiring Massport to define, evaluate, and disclose, every three years, the impact of long-term growth at the airport through a Generic Environmental Impact Report (GEIR). The Certificate also required the submission of interim Annual Updates to provide data on conditions for the years between the GEIRs. The GEIR provided projections of environmental conditions

where the cumulative effects of individual projects could be understood. The Secretary's Certificate on the *1997 Annual Update* proposed a revised environmental review process for Logan Airport. As a result, Massport evaluates the cumulative impacts associated with airport activities through preparation of an ESPR every five years and provides data updates annually through the EDRs.

This 2004 ESPR was originally scheduled to be completed in 2005, but was postponed until 2006. The 2004 ESPR was delayed because of delays associated with the completion of the New England Regional Aviation System Plan (NERASP). Massport adopted the NERASP forecasts for its 2020 Logan Airport forecast of aviation activity in this ESPR, and upon which the analysis of 2020 environmental conditions is based. Postponing completion of the 2004 ESPR ensured that the forecasts used in the ESPR are the most current and accurate forecasts available.

Review of the 2004 ESPR

In general, the ESPR has responded to the scope. In particular, the ESPR contains a wealth of useful data on activity levels and impacts, and lays out a forecast for trends in the future years. The technical studies in the 2004 ESPR included reporting on and analysis of key indicators of airport activity levels, the regional transportation system, ground access, noise, air quality, environmental management, and project mitigation tracking.

As always, EOEA remains committed to evaluating and addressing the cumulative impacts of airport operations on the nearby communities. In June 2001, Massport agreed to work with EOEA on structuring a proposed Air Quality Initiative (AQI). The Certificate indicated that Massport was "to solicit project submissions from local governments and community groups, which will be reviewed in an objective, science-based process by a neutral organization such as NESCAUM." This Certificate on the ESPR reiterates that Massport has committed to the Air Quality Initiative, a key program designed to mitigate the cumulative air quality impacts of airport operations. The 2005 EDR should detail how Massport is meeting this commitment. The 2005 EDR must also address all of the air quality issues raised by the commenters.

Although Massport has presented a detailed ESPR, I remain concerned with a number of environmental issues, specifically air quality and noise related issues, as outlined below.

Follow-up

Massport should submit the next EDR (analyzing conditions for the 2005 calendar year no later than December 15, 2006. I recognize that this Certificate requires the inclusion of considerable follow-up in that document. However, ESPRs invariably raise important issues which require follow-up sooner rather than later, and this ESPR is no exception. I anticipate that the EDR in a year following the publication of an ESPR will always have to include such analytical follow-up to the ESPR and respond to comments on the ESPR. Other EDRs should provide more of a

"snapshot" of the previous year's operations and impacts, with more substantial analysis awaiting the next GEIR. EDRs in years other than the year immediately following publication of an ESPR should therefore be considerably less voluminous and Massport should strive to submit these documents by July 31 of the year following the subject year.

Responses to Comments

The next EDR must include Responses to Comments which addresses all of the substantive comments from the letters listed at the end of this Certificate. The Response to Comments included in this ESPR is well-constructed and cross-referenced (although several comments have complained of general responses or document references in response to specific questions). Massport may follow the same format in addressing comments in the next EDR, although the Responses to Comments should pay particular attention to increased specificity, where necessary.

The majority of comments received on the EDR focused on air quality and noise related issues, including measurement of noise, modeling of noise contours, and noise abatement. In addition to responding to these comments, the 2005 EDR and future EDRs should also continue to report on the refinements to noise tracking and abatement efforts.

Airport Activity Levels

The ESPR included a chapter on airport activity levels, including information on aircraft operations, fleet mix, passenger activity levels, and cargo and mail operations. This chapter also reported on Massport's forecasts that will become the basis for Massport's strategic planning initiatives over the next few years. Past forecasts were based on low, medium, and high passenger activity levels. New forecasts are now based on the forecasts for 2020 developed for the New England Regional Airport System Plan (NERASP) study. This chapter included aircraft operations and passenger activity forecasts, and provided a discussion of methodologies and assumptions, including anticipated fleet mix changes and other trends in the aviation industry.

Air passenger traffic at Logan Airport continued to rebound in 2004, but remained below the peak year level reached in 2000. The total number of passengers using Logan Airport in 2004 increased by 14.7 percent over 2003 levels to 26.1 million passengers. Although the recovery in passenger demand was underway in 2004 at Logan Airport and throughout the industry, legacy commercial airlines continued to struggle financially as competition from low cost carrier (LCC) rivals increased and fuel prices remained high.

For the first time since 1998, total annual aircraft operations (arrivals and departures) at Logan Airport increased compared to the previous year and were at their highest level since 2001. Daily operations in 2004 averaged approximately 1,107 compared to approximately 1,027 in 2003, an increase of about 80 operations per day or about 8.6 percent. 2004 levels remain below historic peaks. The growth in aircraft activity was driven primarily by the entry and expansion of LCCs at Logan Airport in 2004. This increase in LCC services in 2004 stimulated growth in airport

passenger demand.

In 2004, Logan Airport ranked 19th among US airports in total cargo volume. All-cargo operations at Logan Airport declined by less than 1 percent in 2004. However, total cargo volume, including cargo carried in the belly compartments of passenger aircraft, rose by 0.6 percent.

Airport Planning

This section described the status of planning initiatives and projects through the planning horizon year (2020) for the Terminal Area; Airside Area; Service and Cargo Areas; and Edge Buffers and Landscaping. The Airport Planning Chapter also reported on the status of public works projects implemented by other agencies within the boundaries of Logan Airport.

Several projects were completed in 2004:

- The majority of construction of the main terminal and satellite concourse of Delta Air Lines' Replacement Terminal A Project was completed in 2004.
- A dedicated hourly parking area opened on the lower level of the Terminal B Garage in July 2004.
- Massport also launched Exit Express, Massport's convenient way to pay for parking.
- The Massachusetts Bay Transportation Authority's (MBTA's) $23 million new Blue Line Airport Station opened in June 2004.
- Demolition of the old MBTA Airport Station was completed in 2004.
- By the end of 2004, completion of the Central Artery/Tunnel (CA/T) Project and improvements to the roadway system were complete, allowing for a more efficient roadway network with shorter and more direct routes between destinations in the airport and the regional highway system.
- The Silver Line, the most recent addition to the transit system and Boston's first Bus Rapid Transit line, began limited service to Logan Airport in December 2004.

Both Massport and Logan Airport's tenants are proposing projects or exploring planning options to modernize and carry out future improvements at Logan Airport. Massport's planning criteria for Logan Modernization are based on accommodating 45 million annual passengers in airport terminals, facilities, and on airport roadways. Future projects and planning concepts include:

- Both Massport and Logan Airport's tenants are proposing projects or exploring planning options to modernize and carry out future improvements to the existing terminal facilities. Some projects and planning concepts include ongoing expansion and upgrade of Terminal E and constructing a new satellite Federal Inspectional Services (FIS) Facility at the southeast end of Terminal B.
- Some projects and planning concepts that are underway or under consideration include, consolidating flight kitchen facilities in the north service area, constructing new multi tenant maintenance facilities for ground service equipment (GSE), and constructing new

hangar facilities in the north cargo area.

- Airside improvements include upgrades and improvements to the airfield to enhance the operations efficiency and safety of Logan Airport. Some projects and planning concepts that are underway or under consideration include, installing a security wall along the perimeter of the air operations area, providing additional aircraft parking for certain types of aircraft, and an airside improvements planning project to reduce current and projected levels of aircraft delay.
- Buffer areas are being designed in consultation with Logan Airport's neighbors and other interested parties in an open community planning process. Some future airport buffer projects and planning concepts include, landscaping the former Navy Fuel Pier at Jefferies Point, installing a landscaped border in conjunction with the north service area Economy Parking Lot construction, and constructing a half-acre linear area with landscaping and lighting improvements along Maverick Street.
- Massport is considering a parking strategy to address future on-airport parking demands. Some ongoing and future parking projects and planning concepts include redeveloping three parcels into a combined economy parking facility with the capacity for up to 1,750 vehicles, proposed parking facility in the Southwest Service Area, and a new consolidated facility for all car rental operations

Regional Transportation Context

Overall, aviation activity levels at New England's regional airports increased in 2004, as passenger demand continued to rebound both within the region and nationally after the 2001 downturn. Just as the passenger decline seen at the regional airports in the wake of September 11, 2001 was less severe than the declines experienced at Logan Airport, the traffic recovery seen at the regional airports in 2004 was not as strong as the rebound experienced at Logan Airport. Growth at Logan Airport was largely fueled by a growing presence of LCC services.
At the same time, regional airports continued to experience growth in 2004 and served a significant (42.5 percent) share of the region's air passenger traffic. Several factors have contributed to the success of the regional airports in recent years:

- Many of the regional airports benefited from the introduction and growth of LCC services over the past several years. This trend began when Southwest Airlines entered the New England market in 1996 by serving T.F. Green Airport in Warwick, Rhode Island and later expanding into the Manchester and Hartford/Bradley International Airports. The trend continued in 2004 when Spirit Airlines began service from T.F. Green Airport, Independence Air5 initiated low-fare service at several of the regional airports, and Southwest Airlines continued to increase service from its New England airports.
- Several of the smaller airports, particularly Burlington, Bangor, and Tweed-New Haven continued to benefit from the introduction of regional jets and gained new non-stop services to airline connecting hubs, which increase service options for regional airport passengers.

Ground Transportation

The chapter reported on 2004 conditions and provided a comparison of 2004 findings to previous years for variety of ground transportation indicators. The chapter also presented a discussion of analysis methodologies and assumptions for future year conditions for the planning horizon year 2020 for Traffic volumes, On-airport Vehicle miles traveled (VMT) and Parking demand.

- Completion of the CA/T and Logan Airport Modernization projects created a more efficient roadway network with shorter and more direct routes to destinations within Logan Airport.
- With the exception of water transportation, all scheduled and unscheduled high occupancy vehicle (HOV) transportation to Logan Airport saw increased ridership in 2004.
- Overall HOV mode share for air passengers increased from 25.8 percent in 1990 to 32 percent in 2003. Although the data shows a slight decrease to 30.3 percent in HOV modes in 2004, the 2003 HOV mode share was an all-time high, reflecting Massport's success in generally maintaining or increasing the percentage of passengers using HOV modes in all market segments.
- The most recent employee survey showed an employee HOV mode share of 26.8 percent.
- Airport-related average annual daily traffic (ADDT) volumes increased by 12.6 percent in 2004 over 2003 volumes. Despite this increase in ADDT volumes, the vehicle miles traveled (VMT) on Logan Airport's roadway system only increased by 3.5 percent in 2004 compared with the 2003 VMT. This reflects the effects of the changes in the airport roadway system resulting from the CA/T and Logan Airport Modernization projects, which result in a shorter average trip length, creating a much smaller increase in total VMT than in average weekday daily traffic volumes.
- Massport executed a Memorandum of Understanding with the MBTA to commence Silver Line bus rapid transit service in late 2004. Massport's support of the Silver Line Airport service will total more than $30 million over ten years.

Between 2003 and 2004, membership in the Transportation Management Association (TMA) declined by 800 employees, a 13.3% reduction. Massport stated in the ESPR that significant TMA funds had been expended for administrative functions resulting in underfunded programming. The Executive Office of Transportation's MassRIDES program will now provide a TMA coordinator at state expense. The EOT identified its expectation that Massport will "maintain its current level of effort, including both cash contributions and in-kind services.

The Secretary's June 15, 2001 Certificate on the AIPP directs Massport to require that all Logan employers join the TMA at the earliest possible opportunity. This mitigation measure is not listed in Table 10-7 and no plan is presented for meeting this requirement. A plan should be detailed in the 2005 EDR.

The ESPR indicated that two FAA programs had relocated to New Hampshire in 2004 and that Beacon-Skanska, having completed the construction of Terminal A, was no longer at Logan. Four additional corporate members left the TMA in 2004. The 2005 EDR should provide explanation for this.

The 2003 EDR stated that TMA shuttle ridership declined by 32.4 percent due to the elimination of services at mid-year due to lack of funding., but that the decrease in shuttle ridership had been more than off-set by increased Logan Express use. Massport should identify any efforts such as more active marketing of car/ridesharing options targeted to those who previously used the cancelled shuttles. This information should be provided in the 2005 EDR.

Noise

This chapter began with an overview of the environmental regulatory framework affecting aircraft noise, the changes in aircraft noise, the methodologies used to track noise, and what if any changes there was in noise modeling. The information in this chapter built upon the findings of the Boston Logan Overflight Noise Study. This chapter also updates the status Massport's efforts to reduce noise levels and provides noise contours population counts for 2020.

- Massport has continued to make improvements in the noise modeling process as the sophistication of noise models and data acquisition systems has advanced. Recent developments in noise modeling technologies and techniques employed in this 2004 ESPR and to be used in future years include: use of a new radar data acquisition system, known as a long-range PASSUR, for the source of all radar-based operations data; a new upgrade to Massport's radar data processing software; use of the latest update to the FAA's Integrated Noise Model, while retaining the unique capability to account for over-water sound propagation and hill effects unique to Logan Airport; incorporation of more than 1,800 modeled flight tracks, checked and updated where necessary to reflect 2004 radar data; use of radar data to determine the "best-fit" match among each of the nearly 402,000 radar traces captured by Logan Airport's noise monitoring system and the available climb profile contained within the INM database; procurement of an improved noise and operations monitoring system; procurement of automated altitude profile and noise contour generation software.
- From May to August 2004, Runway 4L-22R was closed either completely or partially to accommodate repaving. Due to this closure, jet aircraft departures on Runway 22R decreased by approximately 23 percent compared to 20036 while departures on other runways increased.
- As a result of changes in airport operations in 2004, the number of people exposed to Day-Night Sound Level (DNL) values greater than 65 dB increased compared to the number in 2003. An estimated 10,720 people were exposed to DNL levels greater than 65 dB in 2004, compared to 7,183 in 2003, and 8,309 in 2002. The majority of the increase occurred in East Boston off the northwest end of Runway 33L. The increases within the

65dB are in areas that were previously sound insulated. Despite these increases, the total count of people exposed to 65 dB DNL and above was 23 percent lower than in 2001.

- The 2004 Cumulative Noise Index (CNI) of 153.4 Effective Perceived Noise Level (EPNdB) remained well below the cap of 156.5 EPNdB. Although CNI also increased compared to 2003 and 2002 as a result of the increased number of operations, the 2004 level remained below the 2001 CNI value.

- The number of residential dwelling units for which Massport provided sound insulation in 2004 was 791. Since the program's inception, the total number of dwelling units receiving sound insulation is now 8,615. In addition, Massport completed sound insulation of a 36th school – the new Center School located in Winthrop.

The Logan Airport Noise Study is now expected to be conducted in at least three phases. I strongly encourage Massport to include a phase for the monitoring and assessment of altered flight paths so that any necessary modifications can be identified and implemented.

In addition, the ESPR indicated that there will be an increase from 2004 to 2020 in the number of Boston residents who will experience noise in the 70-75 DNL and the 75-80 DNL due to the use of parallel runways. Massport strive to identify ways to ensure that these increases do not occur. The 2005 EDR should include a preliminary discussion about how Massport will address projected exceedances.

Air Quality

This chapter presented an overview of the environmental regulatory framework affecting aircraft emissions, changes in aircraft emissions, and the changes in air quality modeling. It also predicts emission levels for 2020.

- To ensure consistency and comparability between 1999 and 2004 air quality emissions, the 1999 air emissions inventory was updated with information that was not available when first reported and 1999 emissions were recalculated using the new version of the FAA's Emissions and Dispersion Modeling System (EDMS) v4.21. Additional data were also added to the 2004 inventory in order to increase the accuracy of the results, for example curbside queue times were updated and new parking areas were added to the inventory.

- In 2004, the emission inventory results were driven by an 8 percent increase in aircraft operations compared to 2003 activity levels. Increases in stationary source (fuel storage facilities, heating plant, etc.) emissions further contributed to the increase in levels of volatile organic compounds (VOCs) and oxides of nitrogen (NOx).
- In 2004, total VOC emissions at Logan Airport were estimated to be approximately 1,360

kilograms (kg)/day, which is an increase of 17 percent from 2003 levels. However, total VOC emissions at Logan Airport were 41 percent lower in 2004 than in 1999. The increase of VOC emissions between 2003 and 2004 was due to the increase in aircraft operations in 2004.

- In 2004, total NOx emissions from all airport-related sources were estimated to be 4,290 kg/day, which is an increase of 16 percent from 2003 levels, but is a 26 percent decrease as compared to 1999 levels. Once again, the increase in aircraft operations contributed the most to this increase in airport-related NOx in 2004.

- Total carbon monoxide (CO) emissions at Logan Airport in 2004 were estimated to be 9,852 kg/day, or 3 percent below 2003 levels. In 2004, total CO emissions at Logan Airport were 32 percent lower than 1999 levels. While CO emissions from aircraft increased due to increased aircraft operations, the use of alternative fuel vehicles (AFVs) and the lower emission rates of the motor vehicle fleet helped to reduce the overall CO emissions in 2004. Massport added three new AFVs to its fleet in 2004.

- Massport developed an Air Quality Initiative (AQI) in 2001 as a long-range program with the overall goal to maintain NOx emissions associated with Logan Airport at or below the 1999 level of 2,347 tpy. In 2004, NOx emissions from all airport-related sources were estimated to be 1,726 tpy, well below the 1999 level.

Through the June 15, 2001 Certificate of the Secretary of EOEA on the FEIR for the AIPP, Massport was directed to develop a program to maximize the use of single-engine taxiing procedures by all of its tenant airlines. Massport must describe in the 2005 EDR how it presently encourages reduced-engine (single-engine) taxiing. The cited issues of safety and practicality should be discussed and the program that will be implemented as noted in Table 10-7of the 2005 ESPR should be outlined.

Massport was also directed in the same Certificate to conduct follow-up air quality monitoring in neighborhoods surrounding the airport and surrounding flight paths. This mitigation measure does not appear in Table 10-7, "Logan Airside Improvements Planning Project, Details of Ongoing Section 61 Mitigation Measures." The 2005 EDR should address this measure in detail.

Table 7-13 of the 2004 ESPR , "Inventory of Tracking of NOx Emissions in tons per year for Logan Airport," contains numbers that have been "adjusted to reflect know reductions achieved by Massport and its tenants at Logan Airport." The 2005 EDR should include unadjusted numbers and detailed information about the means for achieving reductions and the emissions value of each reduction method.

Massport had agreed to work with EOEA on structuring a proposed Air Quality Initiative (AQI) in the June 2001 Certificate for the AIPP. The Certificate indicated that Massport was "to solicit

project submissions from local governments and community groups, which will be reviewed in an objective, science-based process by a neutral organization such as NESCAUM." There is no information in the ESPR about the substance and status of any process with EOEA or about the solicitation of information and objective, neutral, scientific review. The 2005 EDR should address this matter in detail.

Environmental Management/Water Quality/Environmental Compliance

This chapter reported on the activities of Massport's Environmental Management Unit in meeting the state's environmental regulatory requirements.

- In 2004, of the 126 spills reported to the Logan Airport Fire-Rescue Department, 18 spills (14 percent) were ten gallons or greater in quantity. Jet fuel spills accounted for 82 (65 percent) of the total spills, with 12 spills (15 percent) being ten gallons or greater in quantity. The remaining 44 spills involved gasoline, hydraulic oil, diesel fuel, ethylene glycol, propylene glycol, paint, and AVGAS. Of these spills, 6 (14 percent) were ten gallons or greater. Since 2002 there has been a reduction in the total volume of all spills.

- In accordance with the Massachusetts Contingency Plan (MCP), Massport continues to assess, remediate, and bring to regulatory closure areas of subsurface contamination.

Massport indicates that it has had limited success in identifying the causes of exceedances due to "first flush" pollutants in stormwater, the number of potential sources at Logan, and the size of drainage areas serving outfalls. Massport needs to develop a plan for maximizing its ability to identify causes. This plan should be identified in the 2005 EDR. Massport should also include in the 2005 EDR copies of any new NPDES stormwater and fire training permits.

Sustainability Initiatives

This Chapter presented Massport's on-going and upcoming sustainability initiatives at Logan Airport. Massport continues to demonstrate forward thinking in sustainability policies and practices for transportation agencies. I encourage Massport to require tenant participation and compliance with all elements of the plan as leases are renewed.

As I stated at the beginning of this Certificate, the 2005 EDR must provide responses to the issues raised in comments received. The 2005 EDR must include a copy of this Certificate and a copy of each comment letter received on the 2004 ESPR. In particular, Massport should provide a thorough examination of issues raised regarding individual noise monitoring locations, noise measurement and modeling, and noise abatement. Massport should consult directly with individual commentors where necessary.

A distribution list for the 2005 EDR (indicating those receiving documents, CDs, or Notices of

Availability) should be provided in the document. This section must also include copies of all GEIR/Annual Update Certificates issued since 1995 to provide context for reviewers. Supporting technical appendices should be provided as necessary.

August 16, 2006
Date

Robert W. Golledge, Jr.

Comments received:

07/25/06	Stephen Kaiser
08/08/06	Nancy Timmerman
08/09/06	MA Executive Office of Health and Human Services
08/09/06	John Vitagliano
08/09/06	Bruce Egan, Egan Environmental
08/10/06	City of Boston Environment Department
08/14/06	Boston Transportation Department

RWG/ACC/acc

B

Comment Letters and Responses

- The six comment letters received by the Massachusetts Environmental Policy Act (MEPA) Office on the *2005 Environmental Data Report (2005 EDR)* are reprinted here in the order shown in Table B-1. As requested in Secretary of the Executive Office of Environmental Affairs Certificate, Massport has provided responses to substantive comments raised in these letters.

Table B-1 Comment Letters Received on the ***2005 EDR***

Author	Organization
Robert A. DeLeo	State Representative
Bryan Glascock	City of Boston Environment Department
Robert D'Amico	Boston Transportation Department
Stephen H. Kaiser, PhD	Member of the public
Joseph Felzani	Member of the public
Nancy Timmerman, P.E.	Consultant in Acoustics and Noise Control

The Commonwealth of Massachusetts
House of Representatives
State House, Boston 02133-1054

REPRESENTATIVE
ROBERT A. DELEO
19TH SUFFOLK DISTRICT
ROOM 243, STATE HOUSE

TEL: (617) 722-2990
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MEPA

Chairman
Committee on
Ways and Means

January 30, 2007

The Honorable Ian A. Bowles, Secretary
Executive Office of Environmental Affairs
100 Cambridge Street
Boston, Massachusetts 02114
Attention: Massachusetts Environmental Policy Act Office

Re: *Boston-Logan International Airport 2005 Environmental Data Report (EDR)—EOEA #3247*

Dear Mr. Secretary:

I write to offer the following comments regarding the Boston-Logan International Airport 2005 Environmental Data Report (EDR). As the State Representative from Winthrop and Revere—two of the most intensely affected communities with respect to the detriments associated with Logan Airport—I urge careful consideration be given to the potential of Logan Airport to cause harm to the health and quality of life of those who live near it.

According to the 2005 EDR, airport passenger levels have increased approximately 3.6% over the past year. If demand for air travel continues to increase and passenger levels continue to climb, the filers must propose long-term solutions to meeting demand which do not include expansion of Logan Airport's capacity or footprint. Rather, solutions should focus on regional airports which must be made to shoulder
S-002-001 a greater percentage of regional flights than they currently carry. The Massachusetts Port Authority (Massport), must encourage the use of regional airports to the greatest extent possible.

S-002-002 Finally, with respect to environmental commitments, the filers must maintain and uphold all commitments relative to environmental monitoring including, but not limited to, particulate and noise monitoring in neighboring communities. This data is crucial to understanding the impact a major international airport has placed upon neighboring communities.

Thank you for your consideration of my comments on the matter. Please contact me if I may provide any additional information or assistance.

Very truly yours,

ROBERT A. DeLEO
State Representative

S-002-001

Chapter 4, Regional Transportation Context, outlines Massport's commitment to regional airports and regional transportation planning.

S-002-002

Massport is committed to monitoring aircraft noise levels in the community, and reports the monitoring results on an annual basis in *Chapter 6, Noise Abatement,* of the EDR/ESPRs. Massport is in the process of replacing its noise and operations monitoring system with a new state-of-the-art system.

In consultation with the Massachusetts Department of Public Health and the Massachusetts Department of Environmental Protection, Massport is undertaking a $1.6 million dollar air quality monitoring study in accordance with its Massachusetts Environmental Policy Act (MEPA) Section 61 findings in connection with the Logan Airside Improvements Project. The goal of the study is to gather air quality data in the communities around Logan Airport with an emphasis on toxic air pollutants. The study will be performed over two 12-month periods using both real-time and time-integrated methods and will include measurement of fine particulates, volatile organic compounds (VOC), carbonyls, black carbon, and polycyclic aromatic hydrocarbon (PAH). Monitoring will be performed at approximately 10 locations.

LATE COMMENT

RECEIVED
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MEPA

LATE COMMENT

February 12, 2007

Ian A. Bowles, Secretary
Executive Office of Energy and Environmental Affairs
100 Cambridge Street, 9th Floor
Boston, MA 02114
Attention: Anne Canaday, MEPA Office

Re: 2005 Logan International Airport Environmental Data Report
EOEA #3247

Dear Secretary Bowles:

The City of Boston Environment Department has reviewed the Massachusetts Port Authority's (Massport) Logan International Airport (Logan) Environmental Data Report (EDR) for the year 2005 and offers the following comments.

We note that Massport is not having success in motivating air passengers and other non-employee visitors, to use transit and high occupancy vehicle (HOV) options. Logan Express ridership is down and parking is up more than 10 percent over a two year period. Massport does not have a HOV goal to reach at current and expected near-term passenger levels. However, offering reserved parking, the Parking PASSport program and planning for additional, on-airport parking does not serve a long-term, environmentally beneficial objective and sends a message to air passengers and community members that driving to Logan is a good option. This department believes that strong, ongoing marketing and incentives for transit and HOV use by passengers, visitors and employees must be a constant endeavor. L-001-001

This department and Massport continue to disagree about the propriety of identifying archaeological, cultural, historic and recreational resources only in connection with projects.

AIR QUALITY AND HEALTH

Massport estimates that total 2005 emissions of volatile organic compounds (VOC) decreased by about six percent over 2004 levels. Nitrogen dioxide (NO_2) concentrations decreased at what is described as the monitoring sites located in the general vicinity of Logan. Oxides of nitrogen (NO_x) decreased by two percent. Massport did not need to purchase NO_x emissions credits to meet the Air Quality Initiative (AQI) goal of 1999 levels.

L-001-001

Strong marketing incentives encouraging transit and high occupancy vehicle (HOV) options are ongoing for both passengers and employees. However, Massport realizes that there is a target population of passengers that are not likely to make use of HOV transit opportunities. This population is often composed of those working for private companies and agencies, who are not experiencing out-of-pocket costs to drive and park at the Airport and are, therefore, unaffected by HOV incentives. In this case, Massport strives to eliminate unnecessary vehicle movements such as circulating in the garage looking for parking or vehicles idling while they wait to pay and exit the parking garage. The parking programs are designed to address this population of Logan Airport users.

Massport remains committed to maintaining and increasing HOV utilization by both passengers and airport employees.

We had requested in 2003 EDR comments that the 2004 Environmental Status and Planning Report (ESPR) include an update on the availability of Alternative Fuel Vehicle Ground Service Equipment (AFV GSE) vehicles and equipment and that Massport explain the type of electric vehicles purchased as part of West Garage Section 61 obligations and detail the operating and maintenance issues associated with these vehicles. Massport responded in the 2004 ESPR that the 2005 EDR would include a discussion of the availability of AVF GSE vehicles and equipment. Response-to-Comment 12 on our 2003 EDR comments noted it had summarized operating and maintenance issues related to some of the electric vehicles. This department requested that this information be provided in the 2005 EDR for all electric vehicles.

Table 7-11, *Massport's Alternative Fuel Vehicle Fleet Inventory at Logan Airport as of December 31, 2005,* identifies 108 vehicles that are fueled by electricity, compressed natural gas (CNG), CNG and electricity (hybrid), gasoline and electricity (hybrid) or propane.

L-001-002 **This department appreciates that conversion of GSE to AFV is a low priority given the tenuous state of airlines' financial health. Our request was designed to obtain information about the types of AFV GSE equipment that are manufactured and will be available when the airlines are making such purchases. Massport's inventory demonstrates its strong commitment to a AFV fleet but does not answer our question.**

In Response-to-Comment 7.17, Massport indicates that no funding for maintenance or battery replacement is provided with the initial purchase of an electric vehicle and that the major maintenance issue is the battery. The average replacement cost for a pick-up truck or cube truck battery is $15,000. Massport has also found manufacturer's support for electric vehicles less than optimal.

We thank Massport for providing information about the maintenance issue with electric vehicles. It is important that this department further its understanding of the difficult issues that may be associated with AFV and equipment that uses alternative fuels.

L-001-003 **We request that information about maintenance of hybrids and CNG- and propane-fueled vehicles be provided in the 2006 EDR.**

We note that, to encourage conversion, Massport offers a 50 percent discount in ground access fees to AFV taxis, limousines and other, unidentified, ground access fleet owners and/or airside service-vehicle owners.

L-001-004 **On a number of occasions, Massport has indicated that airlines have, since the 1970s, implemented reduced-engine taxiing for fuel savings, air emissions reductions and to minimize noise; that it strongly supports the goal of reduced emissions; and will encourage reduced-engine taxiing to the extent safe and practical. As we have previously commented, East Boston residents have consistently reported over time that reduced-engine taxiing has never been a standard, widespread airline practice. This department asked in 2004 ESPR comments that the cited issues of safety and practicality be discussed and that program to be implemented be outlined.**

L-001-002

Currently, there are a wide array of alternatively fueled ground service equipment (GSE). They vary by fuel type and GSE type. Common alternative fuels include liquefied petroleum gas (LPG, and also referred to as propane), compressed natural gas (CNG), and electricity. Many GSE used at Logan Airport have commercially available alternatively fueled counterparts. These include, but are not limited to, baggage tugs, belt loaders, trucks (i.e., fuel, lavatory, service, and water), forklifts, pushback tractors, cargo loaders, bobtails, and deicers. Manufacturers of alternatively fueled GSE include FMC, TUG, Clark, Eagle, Harlan, NMC, Taylor-Dunn, Charlatte, and Stinar, among others. It is expected that the alternatively fueled GSE available today are the same kinds that will be available to Massport's tenants in the future.

L-001-003

There are a number of special maintenance requirements associated with hybrid (combined internal combustion engine and battery-motor system) or dedicated CNG and LPG vehicles as compared to conventionally-fueled vehicles, with attendant maintenance cost differences. For example, tanks that hold CNG or LPG require periodic inspection and certification, and maintenance and inspection facilities must meet special ventilation requirements.

L-001-004

Massport continues to encourage airlines operating at Logan Airport to utilize single-engine taxiing whenever possible. However, it is up to the individual pilots to determine if it is safe to do so. Due to factors such as aircraft weight and weather conditions, single-engine taxiing may not always be safe or feasible. Refer to *Chapter 7, Air Quality/ Emissions Reduction* for details.

A letter in Appendix I is from the *CEO* and Executive Director of *Massport*, Thomas J. Kinton, Jr., indicating, in part, that *Massport* had committed as part of *AIPP* [*Airside Improvements Planning Project*] mitigation to "develop and implement a program designed to maximize the use of single-engine taxi procedures by all of its tenant airlines, consistent with safety requirements, pilot judgment and the requirements of federal laws." Mr. Kinton noted that the ultimate decision as to engine utilization and the conduct of taxiing operations rests with the aircraft's pilot-in-command. He states that *Massport* has found that single- and reduced-engine taxiing is practiced "by a number of *Logan* airline tenants when deemed appropriate by the pilot" and he asks that the current level be continued and increased when feasible.

L-001-005

The letter to airlines would not seem to represent a program and does not, therefore, meet the *AIPP* mitigation requirement. The 2006 EDR should provide the following information:

- **the number of airlines that implement single- and reduced-engine taxiing;**
- **the percentage of overall airlines this number represents:**
- **how this information was obtained;**
- **the criteria used by pilots to decide whether or not to use single-/reduced-engine taxiing;**
- **details about the referenced federal laws; and**
- **detailed information from other U.S. airports that have implemented single-/reduced-engine taxiing programs.**

Massport sought and received from the *FAA* an opinion regarding whether or not the *FAA* would grant an exemption from Part 161 of the Federal Aviation Regulations to allow Massport to implement a curfew on nighttime operations by hush-kitted Stage 3 aircraft at Logan. The *FAA* indicated that such an exemption "is not authorized or consistent with pertinent federal statutory and regulatory requirements."

L-001-006

We understand that a Part 161 waiver has been granted by the *FAA* and ask that the 2006 EDR detail the terms of the waiver and obtain from the *FAA* a written explanation about the differences between that airport and Logan that makes a waiver here "not authorized or consistent with pertinent federal statutory and regulatory requirements."

Massport had indicated in 2003 EDR Response-to-*Comment* 6.1 that it will soon be undertaking an Air Quality Study and will consider including $PM_{2.5}$.

We thank Massport for including PM emissions from aircraft engines in the 2005 EDR. We look forward to more closely reviewing the data and to the ongoing analyses of PM by Massport.

On page 7-25 of the 2005 EDR, *Massport* notes that an air quality monitoring study is required as a condition of the *Massachusetts* Environmental Policy Act (MEPA) for the Airside Improvements Planning Project (AIPP) and, separately, in connection with the proposed *Centerfield* Taxiway. Massport reports that it has developed a plan, set aside funding and selected a contractor to conduct air quality monitoring in the Logan vicinity with monitoring to begin in 2007.

L-001-005

Massport encourages its airline tenants to use single-engine taxiing, however, it is solely the decision of the pilot to determine if conditions are safe to do so. Airline records on the use of single-engine taxiing, if they exist and are made available by the airlines, can be reviewed and compiled.

L-001-006

The FAA has not granted a Part 161 waiver to Logan Airport. As stated in the comment and in the letter from FAA in *Appendix H, Noise Abatement* of the *2005 Environmental Data Report (2005 EDR),* a waiver is "not authorized or consistent with pertinent federal statutory and regulatory requirements."

Clearly a focus on air quality associated with Logan is appropriate as demonstrated by Massport's institution of the *AQI*, the Massachusetts Department of Public Health's (DPH) Logan Airport Health Study and the air quality monitoring study. We note that Then-EOEA Secretary Bob Durand stated in his June 2001 Certificate for the AIPP that Massport had agreed to work with EOEA on structuring a proposed Air Quality Initiative (AQI). The Certificate indicated that Massport was "to solicit project submissions from local governments and community groups, which will be reviewed in an objective, science-based process by a neutral organization such as NESCAUM." Based upon these conditions, Secretary Durand found that "issues of air quality impacts have been adequately addressed for purposes of MEPA review."

L-001-007 The City of Boston sees the potential for collaboration; cumulative assessments of air quality and joint work to reach sound conclusions based upon mutually acceptable science. We suggest that Massport and its air quality study consultant invite representatives of the Massachusetts DPH, the Massachusetts Department of Environmental Protection (DEP) and the City of Boston to work together to ensure a protocol that is acceptable to all parties. This department believes that credibility with Logan's neighbors can only be achieved if a study is based upon assumptions and a methodology that are accepted by the City and by state agencies that have expertise in the subject areas and, in the case of the DPH, are already involved in a closely related effort. Former Secretary Durand was astute in his requirement that an objective, science-based process by a neutral organization be employed to review the project. The health and air quality studies are unprecedented and it is essential that the combined expertise of environmental and health professionals be harnessed to make the most of this exceptional opportunity. We ask that you strongly urge that Massport, before proceeding further with study development, determine if DPH and DEP are available to engage in a process with Massport, its consultants, the City of Boston and a neutral science-based organization in this effort.

L-001-008 As this department commented in response to the 2004 ESPR, "The April 11, 2005 URS memo on the GSE survey analysis shows that a change was made to the time-in-mode data. We request additional information about the decision to make this change." Additional information is not provided.

<u>AIRPORT PLANNING</u>

Future projects being explored or proposed by Massport and/or its tenants are:

- modernizing, upgrading and expanding Terminal E;
- completing construction of the Central Garage Expansion (West Garage Phase II);
- consolidating kitchen facilities in the North Service Area (NSA);
- constructing a multi-tenant maintenance facility for ground service equipment (GSE);
- constructing new and replacement hanger (for those lost to Central Artery/Tunnel Project and an American Airlines hanger to be demolished) and cargo facilities in the North Cargo Area (NCA).
- constructing a cargo facility and two aircraft parking spaces on the Robie Parcel;
- constructing a gas station facility in the NCA;
- consolidated car rental facility in the Southwest Service Area (SWSA);

L-001-007

Massport is conducting the Logan Air Quality Study in coordination with the Massachusetts Department of Environmental Protection (MDEP) and the Department of Public Health (MDPH). Additionally, data from the *2005 EDR* has been provided to the MDPH for its health effects study.

L-001-008

The decision to modify the GSE times-in-mode was made so that the emissions from GSE were reflective of the actual types and operating times of GSE used at Logan Airport in 2004.

- upgrading and improving the airfield by, for example, installing a security wall along the perimeter of air operations, providing additional parking for certain types of aircraft, the *Centerfield Taxiway* and other taxiway and operational enhancements; designing and constructing buffer areas;
- safety improvements in addition to *Engineered Materials Arresting System* (EMAS) for Runway End 22R and 33L;
- a parking strategy to address future on-airport demands including the use of three parcels into a 1,750-space economy facility and construction of a consolidated car rental facility.

L-001-009 **We request that in the 2006 EDR Massport detail the number of hangers permanently taken out of service, the total number of replacement hangers it proposes, the number of net new hangers planned and the reasons for new hangers. In particular, please discuss if and how the changes in the cargo market are affecting the need for hanger space.**

What types of aircraft will use the new parking area(s) and where will these areas be located?

We continue to support a consolidate car rental facility that would include space for car washing and car maintenance and repair.

The 2005 EDR indicates that Massport had identified several parcels in the vicinity of the NCA for relocation of the compressed natural gas (CNG) station. Construction is expected to occur in conjunction with development of the Robie Parcel Replacement *Cargo Facility* (prior to 2010).

Phase I of a consolidated maintenance facility in the NCA is underway and will provide covered storage for large snow equipment. Existing deicing tanks will be replaced with larger tanks that will be relocated to an adjacent area. Phase II would be a major rehabilitation of Facilities Building #2.

ACTIVITY LEVELS AND REGIONAL CONTEXT AND PLANNING

In Response-to-Comment 7.13, Massport states that the ESPR focus regarding domestic passenger airline operations was a comparison between 2003 and 2004. Information on aircraft operations by type and class had been provided for the years 2000-2004. It is our understanding that ESPRs are to provide a picture of airport operations for the full five-year period with EDRs providing information about a single year with comparisons to the prior year. A common understanding of the function and content of each type of document is necessary.

The total number of passengers using Logan in 2005 was 27.1 million, a 3.62 percent increase over 2004. This number is close to 1999 levels; passengers were carried on 86,000 fewer flights. Massport attributes this to increased load factors, operation efficiencies and the use of larger regional jets. Passengers transported by *General Aviation* (GA) aircraft increased by 10.33 percent over 2004 levels.

Total passenger operations were 367,501 in 2005, a 0.84 percent increase over 2004.

L-001-009

Hangar replacement projects are in the conceptual planning phases and the details are not yet available. As the projects move forward in the planning and design process, their progress will be reported on in future EDRs.

Total aircraft operations increased by 0.94 percent over 2004 levels to 409,066. Low Cost Carrier (LCC) operations increased by 13.5 percent. GA operations increased by 4.53 percent due mainly to GA jets. Non-jet GA operations decreased by 16 percent.

Total all-cargo operations decreased by 7.05 percent while total cargo volume, including cargo carried in passenger aircraft, decreased by only 2.78 percent. Massport attributes the change to the improving competitiveness of truck deliveries operations.

L-001-010 **What was the amount of cargo carried in passenger aircraft in 2005, what percentage of overall cargo did that represent and what was the change from 2004? The same information should be provided in the 2006 EDR.**

Overall, fewer flights served New England Regional Airports in 2005 than in 2004. The use of larger aircraft and a 3.8 percent decline in GA operations (versus a 2.5 decline in the U. S. for the same period) suggest a longer range and more jet-focused GA fleet, which grew 2.6 percent in 2005 (versus a 1.00 percent increase in the U. S. as a whole). Regional airports' share of New England air passengers is 43.5 percent, Logan's is 56.5 percent.

L-001-011 **It appears that the characteristics of GA and RJ aircraft have changed over the past five years. For example, our understanding is that the number of seats in each category have increased. We request that the 2006 EDR identify the definitions and characteristics of each type of aircraft and discuss how having larger versions in each category may be affecting fleet mix and operations.**

New England Regional Airports and their increases/decreases in passenger activity for 2005 were:

- Bradley International, CT 9.5 percent
- T. F. Green, RI 4.0 percent
- Manchester, NH 9.1 percent
- Portland International Jet Port, ME 6.1 percent
- Burlington, VT 9.7 percent
- Bangor, ME 6.8 percent
- Tweed-New Haven, CT 63.6 percent
- Pease International Tradeport, NH (73.8 percent)
- Hanscom Field, MA (12.7 percent)
- Worcester Regional, MA 119.0 percent

Regional airport 2005 cumulative commercial aircraft operations increased by 4.6 percent over 2004 levels, GA operations declined by 4.3 percent and military/other decreased by 12.8 percent. Logan's commercial flights increased by 0.6 percent, GA by 4.5 percent and military/other by 0.9 percent.

The report of the New England Regional Aviation System Plan (NERASP) indicates that scheduled commercial airline passenger demand in New England is expected to increase from 43 million in fiscal year (FY) 2004 to 76 million in Calendar Year (CY) 2020. Manchester is expected to experience the fastest growth at 3.9 percent each year with Logan increasing by 3.4 percent.

L-001-010

The amount of belly cargo carried by passenger airlines in 2004 was 316 million pounds, or 39.2 percent of Logan Airport's total. In 2005, passenger airlines carried 298 million pounds of cargo, or 28.0 percent of Logan Airport's total. This represents a 5.7 percent decrease from 2004.

In 2006, 270 million pounds of cargo (or 37.7 percent of the total at Logan Airport) was carried by passenger airlines, a 9.4 percent decrease from 2005. This information is provided in *Chapter 2, Activity Levels* of the *2006 EDR*.

L-001-011

In large markets, airlines are using smaller planes than before and adding flights. In small markets, airlines are using larger planes than before and generally running fewer flights. The net impact at Logan Airport has been a decrease in commercial operations. These changes are being accomplished by substituting narrowbody jets for widebody jets in high-traffic domestic markets, and large regional jets for smaller regional jets and turboprops in low-traffic markets.

Aircraft size is a less important factor in determining general aviation (GA) operations. Airlines strive to offer exactly the right number of seats in a given market and are forced to balance convenience (flying smaller planes more often) with cost (flying more flights with small aircraft costs more than fewer flights with large aircraft). GA operators do not contend with this conflict, as service is offered on-demand, with the result that it is costly for operators to provide and for passengers to purchase. The GA fleet is slowly becoming more jet-oriented. The entry of Very Light Jets (VLJs) into the market may accelerate the trend. The impact VLJs will have on GA operations will depend on whether they are seen as a substitute for other GA aircraft or for commercial flights.

L-001-012 **Why is data reported in FY for 2004 and CY for 2020?**

<u>Hanscom Field and Worcester Regional Airport</u>
Hanscom-New London/Greenwich service was ended in January 2005, leaving Hanscom-Trenton, NJ as the only scheduled passenger service. Pease International Tradeport lost all scheduled service other than that to Hanscom.

Hanscom Field is identified as the premier regional facility for business/corporate GA and as a general aviation reliever for Logan, accommodating GA operations that might otherwise use Logan.

L-001-013 **This department requests that the 2006 EDR detail:**

- **how Massport has determined that Hanscom accommodates GA operations that might otherwise use Logan;**
- **how the construction of a new, state-of-the-art GA facility at Logan is likely to affect the use of Hanscom by GAs; and**
- **Massport's efforts to attract, GAs to Hanscom.**

GA operations at Hanscom were 204,512 in 2000, 175,301 in 2004 and 165,424 in 2005. Clearly, there is ample infrastructure to accommodate many more GAs than are using this airport and the numbers suggest that there is no effort to market Hanscom, branded by the FAA as reliever for Logan and GA airport, as a Logan alternative. Given these circumstances, it seems inconsistent that a new GA facility is being constructed at Logan. It would seem that improving facilities at Hanscom to attract GAs would make the best use of Massport's sub-system and maximize the use of regional facilities.

L-001-014 **As aircraft flying into Hanscom can have not more than 60 seats, it seems likely that the increased number of seats in aircraft designated as GAs and RJs will result in further reductions in operations. Hanscom will then not be serving an appropriate role in the region, receiving far less traffic than it is meant to and capable of handling. This issue should be addressed in the 2006 EDR.**

Capital improvement and maintenance projects at Hanscom in 2005 were:

- Phase I of the East Ramp overlay project and Taxiway Tango resurfacing;
- Designs for upgrading Runway Safety Areas (RSA) for Runway 5-23 were completed and permitting initiated.
- A heated sand storage facility was built.
- Planning continued for Phase II of the Vegetation Removal Project.
- Planning for hangar development continues.

Massport is preparing a Master Plan for Worcester Regional Airport for 2006-2010 in the areas of Runway 11 rehabilitation, RSA improvements and a CAT II/III Instrument Landing upgrade.

<u>Regional Planning</u>
L-001-015 The 2005 EDR indicates that Massport will be contracting with a bus company to provide early morning transportation from New Hampshire to Logan.

See *Chapter 2, Activity Levels*, of this *2006 EDR* for additional discussion of the various classes of jet aircraft.

L-001-012
The data provided are the form in which they are available. FY 2004 is 12 months ending June 30, 2004, and CY 2020 runs from January 1, 2020 through December 31, 2020.

L-001-013
The replacement Signature GA facility at Logan Airport was constructed to replace temporary GA buildings at Logan Airport when those GA operations were moved from the Amelia Earhart building. There will always be a demand for corporate/GA operations at Logan Airport to serve those users in the Boston business district and those users interested in making connecting flights at Logan Airport. Unlike Hanscom Field, there are no based GA aircraft or GA hangars at Logan Airport. As outlined in the Hanscom Field *2000* and *2005 ESPRs*, Massport continues to identify development parcels and areas to support Hanscom Field's growing GA operations. Hanscom Field already supports two Fixed Base Operators (FBO) and there is potential for establishment of a third FBO on the Hangar 24 redevelopment parcel. Massport periodically issues Requests for Proposals (RFP) for GA facility development and redevelopment at Hanscom Field. Hanscom Field has seen an increase in new corporate hangar development and Hanscom Field's two FBOs have increased their hangar space by approximately 40 percent. Hanscom Field's overall business jet activity has increased from approximately 20,000 annual operations in 2000 to over 30,000 annual operations in 2006, an increase of over 50 percent.

L-001-014
As reported in the *2004 ESPR*, the New England Regional Aviation

L-001-015 It would seem that this strategy is designed to encourage New Hampshire residents to use Logan rather than Manchester and, perhaps, to discourage the use of other transportation modes. If so, this action is contrary to Massport's commitment to help find multi-modal solutions for existing and future problems with the capacity of the airspace system. The 2006 EDR should discuss the reasons for initiating this service, identify the target market and describe in detail how the service is being marketed.

We reiterate our prior comment that, although Massport believes it is inappropriate, we believe that air passenger surveys can be legitimately used to gather information about potential air passenger use of other regional airports. The NERASP survey was a single occurrence and, to our knowledge, there is no plan to regularly update survey information. As the operator of a three-airport regional subsystem, Massport has the ability to gather information unavailable from any other source. Such information includes current and potential regional travel behavior, the potential for air passengers to use airports other than Logan, and the reasons Logan was chosen for travel (ticket price, destinations offered, preferred air carrier, preferred type of flight [non-stop, one stop, no plane change, etc.], ground accessibility, no other option [proximity of other airports] and parking availability).

Massport's participation in the planning of regional transportation policy and the implementation of measures designed to maximize broad regional transportation options are important elements of the mitigation for the AIPP. Four of the 11 Regional Transportation Policy Mitigation Policies/Programs in Table 10-7 of the 2004 ESPR, *Logan Airside Improvements Planning Project, Details of Ongoing Section 61 Mitigation Measures (as of December 31, 2004)*, involve the two-phase New England Regional Aviation System Plan (NERASP), a multi-party air service study for which Massport is the contract administrator.

<u>New England Regional Aviation System Plan</u>
Massport is the contract administrator for the NERASP study which is designed to identify strategies to optimize New England's regional airport system. Phase I has been completed, Phase II began in 2005 and a final report was released in October 2006 The study determined that airport proximity and characteristics of service at airports are important factors in passenger choices about airport use.

L-001-016 We noted in our 2003 EDR comments that a NERASP time-line showed an "Outreach" element in about May 2004 but the nature of the outreach was not described nor did the EDR discuss community process. ESPR (2204) Response-to-Comment 34 referred reviewers to the NERASP Web site.

L-001-017 In Response-to-Comment 7.8, Massport states that NERASP was primarily a forecasting effort covering the airports in the six New England states and the forecasting would be used to assist individual airports and the FAA in planning for the mid- and long-term facility needs at these airports.

This description of the purpose of the NERASP study seems inconsistent with a regional planning perspective.

System Plan (NERASP) Study estimates that Hanscom Field will serve 451,000 scheduled commercial airline passengers in 2020 compared to 26,000 in 2004. This demonstrates the ongoing importance of Hanscom Field in the New England Regional Aviation System. Hanscom Field's 60-seat restriction is limited to airlines providing scheduled service. Given the Airport's high proportion of GA operations, it is unlikely that this restriction will have a substantial impact on Hanscom Field traffic in the foreseeable future.

L-001-015

Massport is assisting a bus company to provide an early morning run to Logan Airport and a late evening run from the Airport in an effort to improve HOV service to the North Shore and to Southern New Hampshire. The primary marketing target is Logan empoyees (e.g. flight crew, the Federal Transportation Security Administration [TSA]) and marketing efforts have included informing Logan Transportation Management Association (Logan TMA) employer members.

L-001-016

The *2005 EDR* provided the following detailed response to this request for information on the outreach element of the NERASP Study:

"The NERASP study was primarily a forecasting effort covering the primary commercial airports in the six New England States. The forecasts will be used to assist the individual airports and the FAA in planning for the mid- and long-term facility needs at these airports. A public outreach initiative was originally planned to occur mid-way through the project, but before the airport traffic forecasts has been prepared. It was subsequently determined that such an outreach effort, which would have included public briefings on the project's scope, approach and schedule, would not provide the type of meaningful information that the general public could react to and comment upon. Therefore, it was decided to conduct the public outreach effort after the forecasting process was

L-001-018

This department noted in our comments on the 2002 EDR that. "An FAA follow-up to the 1995 *New England Regional Airport System Plan (NERASP)* is in process with Massport as the prime contractor and an unidentified number of regional airport directors participating. The airports from which the directors come are not identified in the EDR or at the study web site to which EDR reviewers are referred. We note that the web site contains outdated and misleading information. It states that terminal improvements and new commercial carrier services helped to double passenger levels at Worcester between 1999 and 2000 and that commercial service was reintroduced at Hanscom in 1999. The number of passengers that were doubled in Worcester is not identified nor is the subsequent withdrawal of commercial service. The web site does not indicate that the current commercial activity at Hanscom is limited to infrequent Trenton service and that Massport policies and practices ensure that Hanscom does not assume its fair share of regional commercial traffic.

The new study is to evaluate the potential for expanded domestic, international, charter and cargo service from regionals, assess capacity issues at each, and look at high occupancy transportation options for access to regionals in an effort to find ways to make the most of New England's airport system. New forecasting for regional passenger, operations and cargo levels will be included in Phase I, as will updated identification of catchment areas and the identification of new service market opportunities. Phase I is expected to be completed in early 2004. The study web site shows that Pease International Tradeport, New Haven and Worcester are included in Phase I but Hanscom Field is not. This is a significant and problematic omission, again signaling Massport's determination not to use Hanscom to its greatest advantage.

In Phase II, the participants will assess major public policies and regulations that guide systems planning and federal aviation policies or regulations that restrict intermodal planning. Public policies that will support the participants' recommendations for implementation of a regional strategy will be identified.

Missing from the Phase I tasks is updated fleet forecasting. Short- and long-term regional aviation planning will not be complete without this element. The identification of new service market opportunities should, in initial stages, be unconstrained fiscally and on policy and practice bases.

From the City of Boston's perspective, the study and its recommendations have the potential to be most useful if:

- The results of a comprehensive Logan passenger survey designed to elicit a wide range of information is used as a study input.
- Hanscom Field is not treated with undue deference and is included in all study phases.
- Massport's regulations, policies and practices regarding Hanscom Field, contained in a 1978 Hanscom Master Plan and 1980 Hanscom Regulations (which includes noise rules), be treated as major public policies that influence systems planning. These policies and associated practices should be evaluated for the limits they place on the use of Hanscom and the related implications for the regional air

completed.

This post-forecasting outreach includes specially-developed materials for the general public and an intensive series of meetings in airport communities to brief their constituencies on the results of the studies, began in fall 2006. State Departments of Transportation and the individual airport operators are responsible for determining the full extent of the outreach in their areas. The FAA briefed Congressional staff from the 6-state region following the publication of the final report.

The results of the outreach program, subsequent experience, and periodic data collection will be used to produce future revisions to the forecasts and strategies."

L-001-017

The NERASP Study suggested capital improvements and air service goals for the regional airports from a regional perspective. However, the airports are not obligated to pursue these suggestions, as local governments are responsible for enhancements to their airport facilities. There is no reason to believe this will change in the future.

L-001-018

The institutions, corporations, and individuals responsible for compiling the NERASP Study are listed on page 57 of that report, which can be found on the Internet at www.faa.gov/airports_airtraffic/airports/regional_guidance/new_england/planning_capacity/airport_system_plan/.

Worcester Regional Airport served 49,727 passengers in 1999 and 106,145 passengers in 2000, an increase of 113 percent. ("Massport Releases 2000 Passenger Numbers; Regionalization Dampens Growth at Logan; Worcester and Hanscom Take Off," Massport press release,

travel system. This is particularly appropriate given Massport's role as the operator of an air service sub-system in New England.

- Evaluations are conducted in an objective, pragmatic manner with the application of consistent, readily apparent criteria for each study element and airport."

We requested in our 2003 EDR comments that the 2004 ESPR summarize the work and findings of the NERASP work group through 2004, describe a community process and process for review of Phase I work, identify the funding for Phase II and discuss further timelines. The ESPR referred reviewers to Section 4 of the 2004 ESPR and to the NERASP Web site.

In Response-to-Comment 7.8, Massport indicates that "post-forecasting outreach, which will include specially developed materials for the general public and an intensive series of meetings in the airport communities to brief their constituencies on the results of the studies began in fall 2006. State Department of Transportation and the individual airport operators are responsible for determining the full extent of the outreach in their areas. The FAA briefed Congressional staff from the six-state region following the publication of the final report. The results of the outreach program, subsequent experience, and periodic data collection will be used to produce future revisions to the forecasts and strategies."

L-001-019 **The Massachusetts Executive Office of Transportation does not have available information about outreach on NERASP. It appears that Massport is, in large part, responsible for outreach in the areas of its sub-system. It provides no information on this outreach. As the role of other airports and transportation modes in meeting mid- and long-term regional transportation needs is important to Logan-affected communities. The referenced intensive series of meetings with materials for the general public should begin as soon as possible.**

L-001-020 **Massport should describe in the 2006 EDR how "results of the outreach program, subsequent experience, and periodic data collection will be used to produce future revisions to the forecasts and strategies."**

Massport indicates in Response-to-Comment 7.10) that the NERASP survey could provide a model for future surveys in the region.

We note that the survey is not the NERASP Web site so we have been unable to review it.

We had requested in the 2003 EDR comments that the 2004 ESPR report on the status of and plans for:

- **Fly New England, including its joint marketing program.**
- **Pilgrim Partnership.**
- **Regional Transportation Coordinating Council (RTCC) including members, work, plans and timelines.**

The ESPR indicates only that Massport participates in Fly New England, a cooperative marketing association that promotes the following regional airports:

- **Burlington**
- **Bradley International**

January 25, 2001. www.massport.com/about/press01/press_news_region2.html. Visited August 6, 2007.) The subsequent withdrawal of scheduled service from Worcester Regional Airport occurred in 2003 (Official Airline Guide).

L-001-019

The FAA has taken primary responsibility for outreach efforts associated with the NERASP Study. It coordinates with the relevant local authorities to present the study's findings and the impact of those findings in each local market. As of May 2007, meetings have been held in Bangor, Portland, Portsmouth, Brattleboro, Burlington, Worcester, and at Bradley International Airport. Other airports may schedule meetings in the future.

L-001-020

The NERASP Study represents part of an on-going initiative by the FAA, Massport, and the six New England states to encourage coordinated regional planning and greater utilization of regional airports. The Study provides a baseline regarding current conditions at the regional airports and at Logan Airport, and the information developed in this Study provides a means to assist individual regional airports in identifying underserved markets and working with airlines to secure improved services and market penetration. While there is no firm commitment by the FAA to conduct follow-on studies, it is anticipated that such efforts will be undertaken, just as the NERASP Study itself represented a follow-on effort to previous regional studies in the New England region.

- Manchester
- T.F. Green
- Logan
- Portland International Jetport
- Worcester

L-001-021 **We ask that the 2006 EDR include details about the marketing efforts of Fly New England and a description of the interface between these efforts and NERASP.**

L-001-022 **Information about the purpose, membership and work of the Pilgrim Partnership should also be included in the 2006 EDR.**

New England Governors Conference Committee

A Regional Transportation Summit was held in 1999 with Massachusetts and the other New England States developing agreements to expand and improve inter-state regional rail service and evaluate transportation needs and options. A second Summit was held in 2000 to discuss regional transportation issues and infrastructure development, use and efficiency. A decision was made to re-establish the Council of New England Governors Committee on Transportation. In March 2001 the Council of New England Governors adopted a resolution to coordinate and implement regional transportation planning across the six New England states and the Regional Transportation Coordinating Council (RTCC) was established to study and increase the use of regional airports. It

L-001-023 meets quarterly. **We thank Massport for this information and ask that, should it have information on an RTCC initiatives in the future that it mention them in ESPRs/EDRs and provide contact information.**

GROUND TRANSPORTATION

Massport indicated in the 2004 ESPR that it continued to express interest to the Massachusetts Turnpike Authority (MTA) regarding Silver Line access to the "slip-ramp." The MTA responded that the ramp cannot accommodate buses and that a safety problem would be created for traffic in the HOV lane. Massport offered to prepare a Scope and fund a study but MTA declined. The slip ramp was used during the recent closure of the Ted Williams Tunnel which resulted in reduced pressure on the Callahan and Sumner Tunnels. Massport continues in discussions with the MTA.

Massport initiated Exit Express, a system through which patrons use Parking Pay Stations in the terminals and use a pre-paid ticket to exit parking garages.

L-001-024 **The EDR does not indicate the date of inception of this program, the number and location of pay stations, the absolute number of users and the percentage of overall parking patrons represented by this number. This information should be provided in the 2006 EDR.**

Traffic volumes on airport roadways increased by 5.8 percent (Massport attributes to increase in passengers) and vehicle miles traveled (VMT) increased by 4.2 percent. Massport attributes part of the VMT increase to traffic destined to non terminal-related airport users coming through the Ted Williams Tunnel.

L-001-021

Fly New England is a website maintained by the Manchester-Boston Regional Airport to promote commercial airports in New England. While the website is still maintained, more recently the NERASP Study and associated website has served as the New England conduit on regional aviation planning.

L-001-022

The Pilgrim Partnership is an arrangement between the MBTA and the Rhode Island Department of Transportation (RIDOT) under which RIDOT allocates some of its federal funding to the MBTA in return for commuter rail service to Boston from Rhode Island. MBTA Commuter Rail currently reaches Providence, and plans are in place for service to Pawtucket, Wickford, South County, and T.F. Green Airport. Commuter Rail service could potentially attract more passengers from the Boston area to T.F. Green Airport.

L-001-023

Information on the Regional Transportation Coordinating Council (RTCC) will be provided when available.

L-001-024

Parking fees can be pre-paid at kiosks inside the terminals and pedestrian walkways. Pay stations are located at the entrances to the Central Garage and Terminal E parking lot. The percentage of parking patrons using this service trended up over the course of 2006, ending at 79.7 percent of total parkers for the month of December, and a 75.3 percent average for 2006.

L-001-025 **The 2006 EDR should expand upon the speculation that there has been an increase in traffic using the Ted Williams Tunnel that is destined for non terminal-related airport uses. What are those uses and how do they differ from previous years?**

The EDR states that Massport's goal is to promote the use of high occupancy vehicles (HOV), reduce reliance on single occupant vehicles (SOV) and maintain and enhance efficient transportation access and parking options in and around Logan by providing environmentally responsible alternatives.

Logan Express Framingham ridership declined 0.8 percent in 2005 from 2004 levels, Braintree declined by 5.5 percent and Woburn by 3.2 percent. Peabody ridership increased by 13.7 percent (Table G-1). The overall number of riders from Peabody is lower than from the other service areas. Massport is evaluating the costs and benefits of the Peabody service and may consider other options for that market.

L-001-026 **We question if ridership on Logan Express has been affected by the elimination of the guaranteed ride to a Logan Express parking site for air passengers if they arrive after midnight with a pre-purchased Logan Express ticket. This Section 61 Mitigation measure for the West Garage should be addressed in the 2006 EDR.**

L-001-027 **We request that Massport discuss in the 2006 EDR its why the Peabody market has not sustained the Logan Express Service. We are also interested in the options Massport may identify for continuing to serve the area.**

Massport has and continues to provide financial support for Silver Line service which now serves all Logan terminals at 10-minute headways during peak times. It has purchased eight of the dual-mode, 60-foot articulated buses used on the line and is reimbursing the Massachusetts Bay Transportation Authority (MBTA) about $1.5 million annually for operating and maintenance expenses. Massport and the MBTA are collaborating to install equipment for the purchase of Charlie Tickets in each terminal.

L-001-028 **Are peak times those associated with the greatest number of passenger arrivals at Logan or is the reference to traditional, commuter-related roadway peak hours? If peak time headways do not correspond with Logan's operations, potential riders may be discouraged by longer headways. We would then encourage work with the MBTA to match headways with Logan peaks.**

L-001-029 **This department requests that the 2006 EDR identify the locations of all Charlie Card vending machines and describe the marketing strategy to make air passengers aware of the convenience and affordability of the Blue and Silver Lines.**

L-001-030 **Massport indicated in Response-to-Comment 21, responding to our 2003 EDR comments, that it would conduct counts of airport shuttle bus ridership and provide the information in the 2005 EDR. There is no shuttle bus ridership information. It should be provided in the 2006 EDR.**

L-001-025

As explained in this *2006 EDR*, gateway traffic volume counts were not conducted in 2006 due to the tunnel closure of the portion of I-90 connecting the City of Boston and areas to the south and west of Boston with Logan Airport . Therefore, whether this trend has continued cannot be confirmed until the data are collected for 2007 and reported in the *2007 EDR*.

As noted in the *2005 EDR*, gateway traffic data confirm that Ted Williams Tunnel traffic destined for Harborside Drive (or non-terminal-airport uses) has increased since the tunnel opened to general traffic. There are several reasons for this increase:

- A shift in Massport personnel from their offices on the Fish Pier (212 Northern Avenue) in South Boston to the Airport has increased the day to day business operations at Logan Office Center
- An increase in ground traffic at the North Cargo area
- Potential increases in ground traffic destined for FedEx and other non-airport related businesses

L-001-026

Except for 2005, Logan Express ridership has increased by about two percent per year and was up six percent for 2006, suggesting that the elimination of this program has had little or no effect on ridership.

L-001-027

See *Chapter 5, Ground Transportation* for a discussion of Logan Express service to Peabody.

L-001-028

Peak Silver Line service to Logan Airport (Route SL-1) is scheduled to match peak passenger schedules. Since full Silver Line service to Logan

Employee Transportation

Sixteen organizations left Logan Airport Transportation Management Association (TMA) in 2005, leaving nine organizations representing 2,874 employees, a 45 percent reduction over 2004 employee numbers (5,200). There had been 6,000 employee members in 2003, so the 2004 membership represented a 13.3 percent reduction.

L-001-031 **In 2003 EDR comments we asked that Massport conduct interviews with all employers who had left the TMA since 1999. Massport had not conducted interviews as of the time the 2004 ESPR was completed.** The 2005 EDR indicates that Massport has met with several tenants to better understand their needs and plans to conduct assessments with all tenants in the future.

Did Massport meet with tenant members of the TMA, tenants who have never been members of the TMA or with tenants who were members of the TMA and chose not to renew their memberships?

In Response to Comment 1.6, Massport indicates that some tenants have left the TMA and others have not joined the TMA because of budgetary concerns and/or the lack of services that matched the needs of their employees. In some cases, the tenant itself provided alternative transportation services. The reviewer is also directed to Chapter Five, *Ground Transportation Improvements*, for such explanations.

We understand that the characteristics of an airport, such as 24-hour, 365-day per year operation and atypical employee scheduling, require different Transportation Demand Management (TDM) strategies than a business operating Monday through Friday, 9:00-5:00. We applaud Massport for the steps it has taken to understand tenant needs and actions so the work with the TMA manager will be focused upon developing a program that will result in the membership and active participation of all tenants. (Please note that Chapter 5 does not include information about why tenants left the TMA.)

The TMA will investigate the potential to reinstate some form of shuttle service for employees who must be at Logan before 5:00 a.m.

This department supports the resumption of a shuttle service or some other method of assisting employees who work before <u>and/or after</u> the times when MBTA service is offered in getting to Logan. Although the 2003 EDR had stated that TMA shuttle ridership declined by 32.4 percent due to the elimination of services at mid-year due to lack of funding., but that the decrease in shuttle ridership had been more than off-set by increased Logan Express use, Logan Express serves a substantially different employee population than was served by the shuttles. We believe that providing service to those who work early, late or split shifts will encourage new TMA membership.

Parking

Total parking activity increased in 2005 by 1.5 percent over 2004 levels. The number of commercial parking spaces at Logan increased from 11,692 in 2004 to 11,952 in 2005, 260 net new.

Airport started in June 2005, MBTA and Massport have worked to adjust bus headways to match peak passenger schedules. Current SL-1 peak hours are 7 AM to 8:15 PM when the buses operate on 10-minute headways. The remaining schedule is at a 12-minute headway. Based on ridership, off-peak headways were reduced from the original 15-minute schedule. Additional Route SL-1 buses are added during peak travel seasons and holiday periods, as needed.

L-001-029

In a joint venture with MBTA, 13 automatic fare collection Charlie Card machines became operational at seven locations in the Logan terminals in November 2006. There are two machines (cash/cashless) in Terminal A, two machines on each side of Terminal B, a total of five machines in three locations at Terminal C and two machines in Terminal E. Machines are proximate to the Silver Line stops and/or main terminal doors. Massport has marketed the Charlie Card machines in the terminals through press releases and through the Logan TMA. The machines are located immediately adjacent to the Silver Line stops and Massport public service representatives were trained by the MBTA in use of the Charlie Card machines.

L-001-030

Massport conducts ridership counts for selected routes and periods to monitor the quality of service and to ascertain average numbers of riders per bus. This information is used for operational purposes only to adjust bus headways. Counts for all shuttle buses on all routes are not available. Their details will be provided in the *2007 EDR.*

L-001-031

In late 2006, Logan TMA staff requested a meeting with all major employers at Logan Airport to explain existing Logan TMA programs and to explore commuting issues that the Logan TMA might be able to help

Parking at Logan has increased by 10.5 percent increase over two years (2004 and 2005). This is a significant amount.

Fifty-eight percent of 2005 parking was for zero (? under one-half hour) to four hours, down one percent from 2004. Parking for the four to 24 hour time periods and for more than four days increased. One to four day parking was essentially the same for 2004 and 2005. Massport credits the decrease in short-term parking with its initiatives to reduce such parking and overall VMT and believes that this also suggests that parking is priced correctly.

Parking for 0-4 hours represented 59 percent of overall parking in 2004 and 58 percent in 2005. Parking growth was seen in the four to 24-hour time period and in the more than four day category. Growth for one to four days is described as stagnant.

L-001-032 **It would seem that those parking for 0-4 hours would be picking up passengers (arriving early and/or a flight is delayed and/or obtaining checked baggage is slowed) or is at Logan for a non flight-related reason. Massport should determine who the users of parking are for this time period.**

L-001-033 **Parking rates include a 4-7 hour level and a seven to 24-hour level. Who are the primary users in each category?**

L-001-034 **Until user information is known, concluding that the rate scale for Logan parking is working to minimize driving to the airport is premature.**

NOISE

Massport estimates that 2,961 fewer people were exposed to Day-Night Sound Levels (DNL) greater than 65 decibels in 2005 than in 2004. Massport has concluded that the change is due to changes in airport operations.

The specific changes to which the reduction is attributed are not obvious. It appears that the fleet mix has not changed significantly over the past year and Massport notes that operations increased and Runways 14L-22R and 4R-22L were closed completely or partially for unspecified periods of time from beginning in April 2005 but the connection is not clear.

L-001-035 **We are pleased by Response to Comment 1.9 which states that any flight paths altered as a result of the Boston Overflight Noise Study will be monitored and assessed to determine if modifications are necessary. The way in which such tasks might be structured should be discussed in the 2006 EDR.**

In Response-to-Comment 1.10, Massport states that use of the Preferential Runway Advisory System (PRAS) attempts to minimize noise impacts on surrounding communities when possible. (This is a response to MEPA's request that Massport describe how it will act to ensure that projected increases in the number of residents in the 70-75 DNL and 75-80 DNL do not occur.) We find this response somewhat disingenuous. PRAS has not been in operation since mid-2004 and, based upon historical runway utilization data, was not successful in meeting established goals. Whether or not this or a modified PRAS would be implemented by the

address. Logan TMA staff arranged a series of one-on-one meetings with those employers who responded positively. The Logan TMA staff then conducted the meetings, sometimes with Massport staff and sometimes alone. Based largely on the information gathered at those meetings, a series of new commuting initiatives was launched by the Logan TMA in 2007.

L-001-032

As the comment notes, patrons parked between zero and four hours are at the Airport for a variety of reasons, largely related to passenger pick-up and drop-off, collection of lost luggage, and flight delays. Another component to the zero to four hour parking duration could be an increase in regional jet transportation at Logan Airport over the past several years, which has a corresponding increase in short-term passengers. What is important to note is that parking during the zero to four hour timeframe has decreased over the past 10 years from a high of 72 percent of total parkers to the relatively constant 59 percent seen over the past three years. Massport has been able to suppress the number of parkers in this category despite 2001 FAA regulations requiring strict enforcement of curb side regulations. While the number of parkers has remained constant, the reasons for parking for that duration can vary greatly from year to year. Some years see significant flight delays while others see a significantly higher regional jet air passengers and corresponding shorter trip lengths. Given the high variability of passenger mix that are accommodated in the zero to four hour time frame, the cost and man-power needed to undertake such a comprehensive and substantial survey effort is well beyond Massport's means and could potentially include the need to reintroduce staffed exit lanes.

L-001-033

The four- to seven-hour parkers are largely regional jet patrons utilizing the Airport's regional system for day trips and those picking up or

L-001-036 FAA and should therefore remain a part of a noise abatement strategy has been the subject of some discussion among the communities. It would seem that preliminary strategies other than a PRAS must be identified and considered. We ask that this issue be revisited in the 2006 EDR.

L-001-037 As we noted in our 2004 ESPR comments, nighttime flights are the source of significant discomfort for Logan's neighbors and residents under flight paths. The ESPR stated on page 6-11 that a noise monitoring system alerts Noise Office staff of potential violations of the Airport Noise Rules as they occur. The rules prohibit Stage 2 aircraft from using the airport between 11:00 p.m. and 7:00 a.m. We asked that the 2005 EDR describe how this system works and identify for 2005 the number of violations, the dates and times of violations, the type of aircraft involved, and the operator.

Massport's response is that potential violations are identified by a code in radar data; that a review of radar data does not make available information about "hush-kitted" or re-engineered aircraft; that Noise Office staff, through a review of records, tries to determine if there actually was a violation; and that, in many cases, apparent violations are later determined to be exempt as a result of weather or as medical flights. In 2005, there were 36 possible violations of the Stage 2 noise rules.

This explanation requires more detail. What does the code in radar data identify? What is the significance of the inability of radar data to identify "hush-kitted or re-engineered aircraft (isn't a violation a violation, regardless of this type of aircraft characteristic)? How does the Noise Office staff identify actual violations? What role do weather and medical flights play in determining violations? What is the criteria for exemption? How many of the 36 possible 2005 violations were found to be exempt and for what reasons? This information should be in the 2006 EDR for both 2005 and 2006.

L-001-038 We request that the 2006 EDR identify the number and locations of any persons on a waiting list for residential sound insulation.

LAND AND WATER QUALITY

Massport has previously said that the size of the airport, 24 hour operation and numerous tenants and operators make it impossible to identify the causes of pollutant discharges into waterways. Massport indicates in the 2004 ESPR Response to Comment 39 that it has had limited success in identifying the causes of exceedances due to "first flush" pollutants in stormwater, the number of potential sources at Logan, and the size of drainage areas serving outfalls. We again emphasize the importance of protecting the waterbodies that surround Logan.

L-001-039 We strongly support the inclusion of glycol monitoring and a deicing plan as part of a new NPDES permit. Such a plan should include the elements mentioned in the 2003 EDR, locations of deicers, types and quantities of deicers and discharge information. We would add the storage of deicing chemicals to that plan. In addition, we believe that the quantity, composition and discharge of melted snow should be addressed in the permit.

dropping off passengers that are on flights experiencing significant delays. The seven- to 24-hour level is reflective of day trips from Logan Airport to regional locations.

L-001-034

In a general sense, user information related to parking duration is known. Since the Airport is an exclusive service use, the types of trips passengers take, the delays due to flight and luggage issues, and impacts of curbside enforcement can be confirmed using parking duration statistics. The cost and man power needed to undertake a comprehensive and substantial data collection effort is well beyond Massport's means and would provided virtually no knowledge increase due to the variability of services that affect airport parking. Massport has committed to reducing the number of parkers, particularly the number of short-term and SOV parkers at the Airport and the duration statistics bear the fact that their commitment is working. Parking statistics show that almost 800,000 fewer tickets were issued in 2006 when compared to 1997's record parking tickets issued. This is a direct reflection of the cost structure, which encourages longer term parking.

L-001-035

As detailed in *Chapter 6, Noise Abatement* of the *2006 EDR*, a number of alternatives to reduce noise related to Logan Airport overflights have been identified. In spring of 2007 a more detailed analysis of these alternatives commenced. Progress on the Boston Overflight Noise Study (BONS) will continue to be reported in EDR/Environmental Status and Planning Reports (ESPRs).

L-001-036

Massport, the FAA, and the Community Advisory Committe (CAC) are currently conducting the BONS. The goal of which is to determine whether changes to existing noise abatement flight track corridors might

L-001-039 **Massport should include in the 2006 EDR copies of any new NPDES permits approved for Logan.**

SUSTAINABILITY
Terminal A was constructed with attention to sustainability and contains numerous elements that contribute to energy and resource conservation.

Massport identifies its goals as:

- developing a policy that new developments be LEED™ certified and that design teams include a LEED™-accredited professional;
- requiring key personnel to consider the use of alternative fueled vehicles (AFV) when needing a new or replacement vehicle and to select an AFV unless there is a pressing reason to choose otherwise;
- increasing construction waste recycling and reuse: ?
- implementing a process that takes environmental impacts into account when making purchases;
- establishing a recycling program in terminals; and
- retrofitting or purchasing heavy-duty equipment with diesel oxidation catalysts (DOC) or particulate filters.

L-001-040 **Does Massport seek to increase construction waste recycling and reuse to a certain percentage?**

L-001-041 **We suggest that retrofits of heavy duty vehicles may provide the greatest environmental benefit. New equipment is generally fitted with emission control devices. Massport will likely improve air quality with technologies that will last over the life of existing equipment.**

Massport is developing an Environmental Audit Program and an Environmental Management System. It continues to work toward compliance with the Commonwealth's Clean State Initiative in the areas of stormwater/sanitary flow transport in the Central and Terminal B garages and a contaminated site subject to the Massachusetts Contingency Plan (MCP).

L-001-042 **We request that Massport identify in the 2006 EDR the contaminated site subject to the MCP.**

Thank you for the opportunity to comment. We look forward to the continued implementation of important mitigation measures and to the information that the 2006 EDR will provide.

Sincerely,

Bryan Glascock
Director

further reduce noise impacts. Refer to *Chapter 6, Noise Abatement* for additional information on this study.

L-001-037

The code in the radar data is a four-letter FAA code which identifies the type of aircraft being flown. As an example, the Falcon 20 general aviation jet (code FA20) was originally built as a Stage 2 jet. However, a large percentage of these aircraft have been re-engined with Stage 3-compliant engines. The code remains FA20 in the radar data whether the aircraft is certified Stage 2 or 3, therefore the software marks this flight as a potential violation and the Noise office staff has to further investigate this flight to determine whether or not it is a violation. If a flight was delayed due to weather conditions or if the aircraft is operating as a medical flight then it is exempt from the noise rules.

L-001-038

Massport provides sound insulation to all residents that are eligible for funding under its residential sound insulation program (RSIP). On an annual basis, Massport prepares noise contours for Logan Airport, and identifies those residences that are located within the 65 dB DNL contour which determines eligibility under FAA guidelines.

L-001-039

The EPA issued a new NPDES permit for Logan Airport on July 31, 2007. The permit includes monitoring for both ethylene glycol and propylene glycol at the outfalls. It also includes a requirement for a Pollution Prevention Plan (PPP) for deicing chemicals. The PPP would include specific procedures for both aircraft and runway deicing to reduce the use and discharge of glycol, including the use of alternative deicing techniques. Melted snow is not addressed specifically in the permit. However, any liquid discharged through the Airport's drainage system would be subject to the testing and performance standards in the

cc: James W. Hunt, III, Chief of Environmental and Energy Services, City of Boston
Michael Kineavy, Director of Policy and Planning, City of Boston
Vineet Gupta, Director of Policy and Planning, Boston Transportation Department
Robert D'Amico, Boston Transportation Department
Jacquelyn Wilkins, Massachusetts Port Authority

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NPDES permit.

Chapter 8, Water Quality/ Environmental Compliance Management of the *2007 EDR* will summarize the new monitoring requirements of the NPDES permit.

L-001-040

Massport implemented a terminal recycling program starting with the new Terminal A in 2005, Terminal C in 2006 and Terminals B and E in 2007. The program consists of post security collection of mixed paper (newspaper, cardboard and magazines) and plastics, aluminum, and glass. Massport's administrative building at the Logan Office Center also participates in this program. In addition, Massport's construction contracts include a requirement for recycling of demolition debris and other materials.

L-001-041

Massport agrees. Massport has retrofitted two heavy duty vehicles at Logan Airport and has applied for grants to retrofit more.

L-001-042

Contaminated sites subject to the MCP that still require further action are identified in *Chapter 8, Water Quality/Environmental Compliance and Management* of the *2006 EDR*.

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January 31, 2007

RECEIVED
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MEPA

Robert W. Golledge Jr., Secretary
Executive Office of Environmental Affairs
100 Cambridge Street, Suite 900
Boston, Massachusetts 021114

Re: ***Logan Airport 2005 Environmental Data Report (2005 EDR) –EOEA #3247***

Dear Secretary Golledge:

The Boston Transportation Department (BTD) has reviewed the above listed document and is pleased to submit the following comments for your review.

Activity Levels

In 2005, the level of flights at Logan increased by 0.9% over 2004 while the level of passenger growth for the same period was 1.7%. In a small way, this is a positive sign from an environmental perspective since it usually means that the airlines are attempting to accommodate growth in passenger demand with fewer flights by using larger aircraft. In 2004 Logan averaged 64.5 passengers per flight while in 2005, Logan averaged 66.2 passengers per flight. While this change in fleet mix management may have been the result of economic necessity due to the price of aviation fuel, it still results in a noise benefit for communities impacted by Logan flight operations.

The only caveat to this condition was the 11.79% increase in the number of General Aviation jet operations at Logan. Many of these jet aircraft emit a large noise signature and are currently not covered under federal noise legislation. However, BTD was pleased to hear that Massport was in complete support of new proposed legislation that would hold general aviation accountable to the same noise rules as the operators of aircraft over 75,000 pounds.

Airport Planning

Page 3-17, Table 3-5

L-002-001 Under the Status Section, the report states that Phase 1 of the Southwest Service Area Buffer Program is complete.

THOMAS M. MENINO, Mayor

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L-002-001

Massport's planning of the Southwest Service Area (SWSA) will be sensitive to the abutting community and will include outreach. As part of the SWSA planning effort associated with the proposed Consolidated Car Rental Facility and Commercial Parking Garage, Massport will work with surrounding communities through a planned public outreach and coordination effort. Pedestrian access to and in the vicinity of the SWSA is being incorporated into the redevelopment plan.

BTD continues to work Massport and the Public Improvement Commission (PIC) on the re-design of Maverick Street from Jeffries Street to the Logan Airport Harborwalk. Upon completion of the new design, Massport will commence with the Maverick Street improvement plan. This will result in a complete redesign of Maverick Street from Jeffries Street to Logan Airport.

Page 3-19, Table 3-7

The report lists two future projects, the Commercial Parking Facilities Plan and the Consolidated Rental Car Facility. Both of these future facilities will be built in the Southwest Service Area of the airport. This particular area was the former site for the United States Post Office, and more recently was selected to be the new site for the airport Park & Fly operation as part of the three-way land swap between the original Park & Fly owners, Massport and Mass Highway. Subsequent to the purchase of Park & Fly by Massport, the original plans for the property changed and the future use for the area will be for a consolidation of car rental and commercial parking facilities.

Although development for this particular section of Logan Airport is still in the early planning stages, residents remain extremely anxious on how Massport plans to develop the land. The Southwest Service Area directly abuts homes on Maverick Street and the proposed buffer park. The buffer park will continue from Maverick Street along Venice Street (Airport Road) to the East Boston Stadium and provide an extra entrance to the stadium for the general public. Currently, the site is used for airport parking and a cab pool. Access to the site for all vehicles is along Venice Street. It will be essential that Massport incorporate careful planning to ensure this immense project will not pose a threat to residents either walking or biking to and from the stadium.

Regional Transportation Context

Page 4-7, Paragraph 3

In 2005, **43.5%** of New England's air passengers enplaned or deplaned at one of the regional airports. However, these airports also accounted for **70.6%** of all the region's flights. Logan accounted for the remaining **56.5%** of passenger activity on only **29.4%** of the total flights. On average, Logan flights averaged **66.2** passengers per flight while the remainder of the airports in New England averaged **21.3** passengers per flight.

Once again, we commend Massport for their continuing effort in working with the airlines serving the Boston Market in their attempt to have the them use larger aircraft which not only benefits the airlines, it also decreases the noise and air quality impacts for those residents living near Logan.

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Page 4-11, Point #2 Re: Manchester Airport

Included within the Manchester Airport 1997 Master Plan is construction of a glycol collection/treatment facility.

L-002-002 BTD believes Massport should seriously consider the construction of such a facility for Logan as well. Logan is surrounded by water on three sides, and during the winter months when aircraft must be de-iced, tons of glycol is deposited into the airport's drainage system. L-002-003 Although many claim that glycol is harmless, a study of glycol impact at Logan should be performed based on the volume of the liquid disbursed into neighboring water systems.

Page 4-12, New England Regional Aviation System Plan

The New England Regional Aviation System Plan concluded that expanded service particularly jet service to major markets would enhance the ability of the regional airports to capture a greater portion of the New England Market share. While BTD completely agrees with this conclusion we believe the plan could be more effective if representatives from the airline industry were included. The inclusion of people actually in the airline business would provide valuable information into the everyday process of airline operations and how the industry actually determines the most effective and efficient fleet mix for their particular route system. Unless the airlines are included in a strategic plan to create greater equality with the dispersion of their jet aircraft fleet for the New England Market, Logan will continue to dominate the use of jet transport aircraft for the region.

Ground Transportation Improvement

L-002-004 High Occupancy Vehicle (HOV) ridership was down across the board for Logan in 2005 in comparison to 2004 while Logan's Transportation Management Association (TMA) membership was down 45% for the same period. Massport must find ways to reverse this trend. BTD worked closely with Massport in 1999 to establish the Logan TMA shuttle service. Although the service did not meet its desired level, BTD believes the plan had merit and would suggest that Massport consider the potential of returning the service. However, any new plan would have to provide more flexibility than the former program. Both the level of service and operational envelope would have to expand on the former plan otherwise the result will be the same as the previous experience.

L-002-005 One minor point, on the last line of ***Page 5-24***, (New 2005 Parking Service) we believe there are several words missing in two separate places.

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L-002-002

EPA issued a new NPDES permit for Logan Airport on July 31, 2007. The permit requires a Pollution Prevention Plan (PPP) for deicing chemicals. The PPP would include specific procedures for both aircraft and runway deicing to reduce the use and discharge of glycol, including alternative deicing techniques and improved chemical management. The NPDES permit specifically requires the consideration of a reorganized drainage system with glycol collection and treatment, and an analysis of the feasibility of such a system at Logan Airport.

L-002-003

EPA issued a new NPDES permit for Logan Airport on July 31, 2007. The permit requires a Best Management Practices (BMP) Plan, which would identify sources of pollution potentially affecting the quality of the Airport's discharges and ensure the implementation of BMPs to to minimize and control these pollutants. Although this would not necessarily include a volumetric analysis of glycol discharges, the reduction of the use and discharge of glycol is a specific priority of the draft NPDES permit, including the use of alternative deicing techniques and a feasibility study for an improved collection and treatment system.

L-002-004

In 2006, the Logan Transportation Management Association (Logan TMA) put together a preliminary plan to reinstate the East Boston early morning shuttle service (formerly known as the Logan TMA shuttle service). This new service ("Logan Sunrise Shuttle") began August 6, 2007 and operates on a half-hour schedule, from 3:00 AM to 5:30 AM, seven days per week. The key elements of the finalized plan and initial ridership will be described in the *2007 Environmental Data Report (2007 EDR)*.

Traffic impacts in East Boston due to Logan traffic have improved in recent years since the opening of The Ted Williams Tunnel (TWT) and the completion of the Logan roadway network.

However, one final location remains to be addressed which to this day impacts Jeffries Point with cabs, Livery vehicles, employees and a variety of business and airport related vehicles. The south access/egress point onto city property (Maverick Street) remains open to a free-flow of airport related traffic. BTD requests that Massport incorporate a traffic control system that will mitigate traffic impacts in Jeffries Point. **L-002-006**

Noise Abatement

Logan Airport has historically been known to have one of the most effective Noise Abatement programs in the country. BTD is pleased to know that Massport is now using RealContours, RealProfiles, the FAA's 6.1 Integrated Noise Model and continued use of a new radar acquisition system known as a long-range PASSUR for the source of all radar-based operations data. The use of these state of the art programs ensure the public is receiving the most accurate and up to date noise information available.

L-002-007 If there is one area Massport can improve on, is the use of retrofitted Stage 3 Aircraft by tenant airlines. Although technically out of their control, Massport should work closely with these carriers in an attempt to have those particular airlines to use more environmentally friendly pure Stage 3 aircraft, especially those aircraft with high bypass ratio engines. BTD understands that Massport discusses these issues with the airlines, but we would like to see a greater effort regarding this matter on their part.

Finally, the FAA will soon be issuing their Record of Decision (ROD) on the Centerfield Taxiway (CFT). Massport contends that during a southerly wind condition, the CFT will have a positive environmental affect on the residents of Orient Heights and Winthrop. It is difficult to understand how there will be air quality and noise benefits for these residents when the CFT will result in more aircraft on the field simultaneously with their engines running. It should be further noted, that during the citizen review process, two alternatives were studied. Under the south flow scenario, Alternative 1 would only allow aircraft taxiing for departure using the CFT to only use Runway 22L. Alterative 2 would allow a pilot to choose between 22R or 22L for departure. In the opinion of BTD, both alternatives will have a negative impact on Winthrop and Orient Heights. However, if the CFT is built, we sincerely hope that Massport will select Alternative 1, which has far less environmental impacts than alternative 2.

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Other initiatives undertaken by Massport to increase high occupancy vehicle (HOV) ridership are detailed in *Chapter 5, Ground Transportation.*

L-002-005

The text should read "The second program, Parking PASSport, is geared toward travelers, companies, or other organizations that are not likely to make use of HOV transit opportunities."

L-002-006

The Maverick Street Gate Project will implement a card-controlled gate at this access point; cards will be available only to qualified East Boston residents. Project construction started in mid-July, 2007.

L-002-007

Massport understands the importance of this issue and continues to address it with the airlines serving Logan Airport. Massport has published Table 6-12 in *Chapter 6, Noise Abatement* for the last two years which details each airline's use of retrofitted aircraft at Logan Airport. Massport also has published Table 6-13 which characterizes noise on a per flight basis by airline. In reporting this data to the public, Massport hopes to encourage airlines to improve their performance in terms of noise generation and reduction.

Page 5, Logan Airport Environmental Data Report

Project Mitigation Tracking

Page 9-19 Point 3, Future Phase for Terminal E

Point 3 mentions the future phase of Terminal E include the addition of three gates for wide body aircraft.

L-002-008 Due to its size and operational characteristics, Massport should be required to inform the public whether this new addition would be able to accommodate the Airbus A-380 Super Jumbo Jet.

Page 9-30 Table 9-6

L-002-009 On a minor point, BTD would request a clarification on the final sentence in the ongoing portion of the Status Section regarding Worcester Airport.

Federal Aviation Letter on (14 CFR Part 161) waiver or exemption

In 2006, Massport requested an opinion from FAA regarding whether a waiver or an exemption from the above regulation would be available for implementation at Logan Airport. FAA concluded that such a waiver or exemption from the requirements of Part 161 would not be approved since it would not be consistent with pertinent federal statutory and regulatory requirements.

The purpose of this request was to allow Massport to impose a curfew on nighttime operations by hush-kitted Stage 3 aircraft at Logan Airport.

L-002-010 However, FAA continued to state that the regulation in question did not apply to voluntary agreements. Therefore, should Massport enter into an agreement with any airline willing to prohibit any of their aircraft of this type from operating during the nighttime restricted hours at Logan, it would be perfectly legal under FAA regulations.

L-002-011 Based on this federal regulatory process, BTD would like to request that Massport develop an extension of their noise abatement program that would include an ongoing dialogue with the airlines serving Logan on this important issue. While it is clear airlines with a small fleet mix would find it difficult to comply with this type of request for financial reasons, airlines with a substantial fleet mix could use innovative methods to replace their retro-fitted aircraft with high bypass ratio Stage 3 aircraft to serve their operations at Logan Airport.

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L-002-008

Logan Airport could accommodate a diverted Airbus A-380, however, Massport does not anticipate such aircraft using Logan Airport on any regular basis. These aircraft are currently expected to be used in larger long-haul markets such as New York, Chicago, and Los Angeles. The future phase of Terminal E was not designed to include the dual-level loading gates needed for regular Airbus A-380 service.

L-002-009

A CAT II/CAT III Instrument Landing System (ILS) is a set of directional antennas which are used to guide pilots onto the runway, particularly in low-visibility conditions. Higher categories indicated higher precision; autopilot systems can land aircraft based on the signals from some Category IIIC ILS.

L-002-010

Massport continues to encourage airlines to eliminate their marginally Stage 3-compliant retrofitted aircraft at Logan Airport. As shown in Table 6-12 of *Chapter 6, Noise Abatement* of this *2006 EDR*, many airlines have begun updating their fleets with full Stage 3 aircraft.

L-002-011

While Massport understands the importance of this issue, the Authority has no legal or other control over the aircraft that use Logan Airport.

Air Quality / Emissions Reduction

Within Section I of the EDR is a letter from Massport to the Logan's tenant air carriers regarding the issue of single engine taxiing. BTD supports this idea, as we believe it would have a positive affect in the air quality for nearby residents.

L-002-012 Massport attempted this procedure in the late 1970's; unfortunately it did last very long. The problem with the program at that time was that it lacked a strong coordinated effort on the part of Massport. When the Massport received complaints from the airlines, the agency abandoned the plan completely. While it is unclear if any airline is currently performing a single engine taxi operation as part of company policy, BTD believes that Massport should give this idea more attention and make it a serious part of their noise abatement program. BTD clearly understands that Massport cannot force the airlines to use a single engine technique at Logan. However, with a strong support program on the part of Massport, we believe the airlines would take the plan more serious than the previous attempt and give it greater effort. In addition to air quality benefits, singe engine taxiing would also reduce noise in surrounding communities and result in less fuel consumption for the airlines.

L-002-013 Finally, Massport should include in any single engine taxi scenario, a suggestion that the engine or engines powering the aircraft be those on the airfield side of the aircraft. In this manner, the aircraft's fuselage will act as a shield between the engines and the community.

Section K, Peak Period Pricing

L-002-014 BTD supports the idea of Peak Period Pricing. However, we believe that Massport's plan does not go far enough to be effective. In order for Massport to activate Peak Period Pricing, projected good weather (VFR) delays would have to reach 15 minutes per operation. According to the FAA and Massport, Logan's good weather (VFR) throughput is approximately 120 flights per hour. Therefore, VFR delays are not expected to occur at any level below 120 flight operations per hour. Unfortunately, severe noise and air quality impacts occur far below this level. BTD would like to suggest that Massport consider reducing the 15-minute VFR delay level to 10 minutes. This would result in a trigger that would occur with less than 120 flights per. Unless there is a change to the current delay criteria to trigger Peak Period Pricing, the program will not occur at Logan for many years, or may never occur at all.

Sincerely,

Robert D'Amico
Senior Planner

BOSTON TRANSPORTATION DEPARTMENT
ONE CITY HALL PLAZA/ROOM 721, BOSTON, MA 02201 • (617) 635-4680

L-002-012

Massport will continue to monitor the use of single-engine taxiing by tenants. Due to the current price of jet fuel, airlines already have a strong incentive to utilize single-engine taxiing whenever possible. The assistant Secretary for Aviation & International Affairs, Andrew Steinberg, before the Committee on Commerce, Science, and Transportation in January 2007 stated that the uncertainty in fuel price will continue to motivate the industry to be cost disciplined in several areas, including fuel usage. He continued to say that fuel saving initiatives, such as single-engine taxiing, have resulted in significant cost savings. Due to fuel price, and the extremely competitiveness of the industry, it is most probable that airlines already practice single-engine taxiing to the maximum extent they can.

Implementing an airport-wide reduced engine taxiing program is not practicable, nor does Massport have that legal authority. The ability to use single-engine taxiing safely is predicated upon various factors such as weather conditions and aircraft weight. Pilots must make judgement calls as to when single-engine taxiing is safe, and airlines may have different policies that define when conditions allow safe single-engine taxiing.

L-002-013

In August 2006, Massport requested that airlines voluntarily use single-engine taxiing when possible. Due to the airfield configuration at Logan Airport, the engine that faces the airfield at the beginning of a taxi operation may not face the airfield through all phases of that operation.

L-002-014

The Logan Airside EIS demonstrated that a 15-minute trigger for peak period pricing would provide delay benefits at Logan Airport. Further, Massport's 15-minute threshold is consistent with the FAA's definition.

February 5, 2007

Stephen H. Kaiser
191 Hamilton St.
Cambridge Mass. 02139

To : Ian Bowles, Secretary of Environmental Affairs
MEPA Review Unit, 100 Cambridge Street
Attention : Anne Canaday

RECEIVED
FEB 7 2007
MEPA

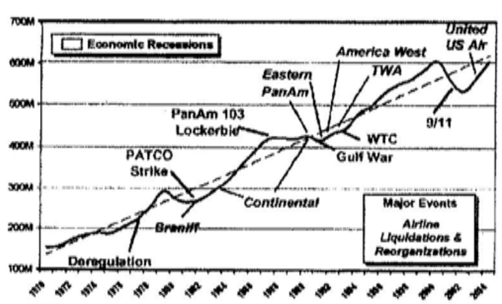
From : Stephen H. Kaiser, PhD

Boston-Logan International Airport : 2005
Environmental Data Report EOEA #3247

As I understand it, the structure of the Environmental Data Report is to provide an update only, with major reassessment in the form of an Environmental Status and Planning Report revision every five years. I commented on the ESPR of 2004, and these comments on the 2005 EDR will be somewhat brief. Many of my concerns from last year still apply, but I did note that, in EDR Chapter 2 on Activity Levels, MassPort has expanded the graphics to show <u>15-year trend lines</u>, rather than just 5 or 6 years. This expanded trend line is much more valuable, and provides for a better informed sense of growth trends for Logan activities.

I note with regret that the latter part of Chapter 2 was deleted, from "the Cyclical Nature of the Airline Industry" on, and this deletion is unfortunate. The biggest loss was Figure 2-13, which showed a 35-year trend line of national

Figure 2-13 US Domestic Airline Enplanements - 1970-2004 (in millions)



Source: US DOT, Form 41, Airline Reports.

Page 2 February 5, 2007

ridership growth and the various influential events which occurred during this period. I think we need to keep this figure as well as seek to show a similar diagram for Logan Enplanements (local as compared to national).

I-001-001

The growth curve shown in Figure 2.13 is linear, not exponential upwards, and the difference of extending this trend to 2020 should be shown. My files show that eight years ago Massport officials met with the Community Advisory Board, and the prevailing question was : what are the growth limits at Logan? Winthrop selectman Robert Driscoll was quoted in the Globe of February 21, 1999 that "It strike me that Logan has reached its capacity." A representative from Roxbury claimed "The airport has reached its capacity, is saturated and must look elsewhere." A suburban viewpoint was that the real goal should be "about expanding Logan's capacity," while Bernice Mader asked MassPort "When are you at capacity?" Then aviation director Thomas Kinton replied : "We don't have an answer to that."

I-001-002

What are indeed the capacity limits for Logan as the airport exists today? We need to specify those capacity limits for each individual function : ground access, baggage handling, enplanement, runway capacity and safety. Each factor should be specifically calculated and laid out in the next edition of the EDR.

I-001-003

One difficulty that is always a result of the MEPA process is that the report process lags the media by a year. We can read in the newspaper that in 2006 the total passenger count approached that of the 2000 record : 27.7 million. Another way to view that result is that from 2000 to 2006 the passenger count did not increase, and may still be below the trend line (as appears to be the case for national data). Is there an additional limit on airline passengers -- that the combination of travel costs, seat discomfort, meetings by video or audio only, and use of the Internet will produce a decline in travel demand? There also appears to be a trend (paralleling the fortunes of Cheney-Bush) that the chief executive becomes increasing suspect, as well as his minions. Public acceptance of business executives shuttling around the nation and world may decline in delayed reaction to Enron and Home Depot. Efforts by corporate officials to hide their travels by using corporate jets has some appeal, but also may not be totally satisfactory.

I-001-001

While Figure 2-13 of *Chapter 2, Activity Levels* from the *2004 Environmental Status and Planning Report (ESPR)* reflects the observation that the airline industry has overcome past disruptions, one cannot assert that the next 14 years will see a similar trend. For a discussion of some of the uncertainties affecting passengers and airlines in the United States (U.S.), see *Chapter 2, Activity Levels*.

I-001-002

Environmental Data Reports (EDRs) provide annual snapshots of the environmental impacts associated with Logan Airport operations. The requested analyses exceed the scope of the EDRs.

I-001-003

Demand for air travel has grown steadily since the industry was deregulated in 1978 despite the introduction of several new modes of communication over that period, including fax machines, e-mail, and large-scale teleconferencing. Assuming that the fundamentals of the economy are strong, any long-term decline in airline passengers is more likely to result from supply constraints (including, for example, airspace congestion or fuel prices) or the development of a new mode of rapid, long-distance travel, such as a true high-speed rail network. None of these factors is likely to significantly impact passenger demand in the next four decades.

I also read in yesterday's Globe that the FAA is warning of gridlock in the skies, and claim that the airlines' use of smaller jets is "adding to the workload of controllers." However, at Logan in 2006 there were almost 17% fewer flights compared to 2000, suggesting the Boston's experience is the opposite of FAA's claims. Is there a risk of gridlock, or is this simply political huffing and puffing by FAA?

The EDR did not, as far as I could tell, discuss recent trends towards very light jets, and the trend away from turboprops. There may be an energy penalty by this move, but what are the noise consequences? There are important regulatory consequences as well from switching to a fee structure based on user fees such as aviation fuel, rather than a ticket tax which does not apply to general aviation. Would a new fee structure reduce the growth in general aviation?

I-001-004

Last year, Peter Howe of the Globe reported on some of the effects of the Logan public address system. The new sound system may win plaudits from many users (especially compared to the notoriously low-fi gratings of the MBTA), but one executive was quoted as hearing a Christmas medley for the 14th time "and I want to throw something at the ceiling." Has Massport ever considered that through certain irritations it has driven certain people to head for the nearest bus or train station? I am one of those people who has voluntarily decided not to fly -- not because of the airlines or their cramped seats -- but because of the horrendously Yuppie atmosphere of our modern airports. I am not suggesting that there is any major public revolt out there -- at least not yet. The real question is what happens to the trend line in Logan growth. Does growth go on forever, or could plane ridership become like our magazines and newspapers, who in 2006 suddenly realized they were is virtual free-fall for readers and advertising revenues? The print press has been predominant almost since Gutenberg, but its current decline reminds me of the railroads in the 1960s. How long before the air travel industry is similarly afflicted?

Sincerely,

Stephen H. Kaiser, PhD
Citizen Engineer

cc. Jacki Wilkins, Massport

I-001-004

Massport's current fee structure is already designed to encourage GA users to base their operations at Hanscom Field. This strategy is very effective: there are no based operators at Logan Airport.

As very light jets (VLJs) become more of a factor and meaningful data become available, Massport will evaluate their operational and environmental impacts.

Canaday, Anne (ENV)

From: Ajfelzani@aol.com
Sent: Wednesday, January 31, 2007 3:36 PM
To: Canaday, Anne (ENV)
Subject: Past meeting at the airport:

I-002-001

I Joseph Felzani (Ajfelzani.AOL.com) was the noisy one at the past meeting. I tried to make the problem of noise over my house uppermost...I also brought up the problem of signage. What-ever you can do to press this problem up to those that are involved,would be greatly appreciated.

Namely: 1) Noise-insullation.
2) Signage

The travelor going into the airport has trouble reading the signs. Speed is a factor,but the roads and the sins are difficult to understand at times.

My presence at the meeting wa s mostly to bring to the attention of those involved about the noise factor in my area

My House is on the same path-way as the L22/R22 airstrip. the amount of traffic from airplanes must approach the airport over my house. You can see that at lower level that the airlines must decend to land that the noise is truly a factor... It is in the 65 dbbl area.

What ever you can do...or bring to the attention of those that make the correct decisions w ould be greatly appreciated.

Yours truly;
Joseph Felzani

2/7/2007

I-002-001

Noise mitigation efforts at Logan Airport are detailed in *Chapter 6, Noise Abatement.*

AC

Nancy S. Timmerman, P.E.
Consultant in Acoustics and Noise Control
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Boston, MA 02118-1609
(617)-266-2595 (Phone & FAX)
nstpe@hotmail.com
nancy_timmerman@comcast.net

February 5, 2007

RECEIVED
FEB 6 2007
MEPA

Massachusetts Environmental Policy Act (MEPA)
Executive Office of Environmental Affairs
100 Cambridge Street, 9th Floor
Boston, MA 02114

Attn: Anne Canady MEPA Office

Subject: EOEA #3247-Logan Airport 2005 Environmental Data Report (EDR)

Dear Ms. Canaday:

These comments are being transmitted by email and fax. A hard copy will also be sent.

I have reviewed the noise sections of the 2005 Environmental Data Report (EDR), EOEA #3247 (Chapter 6 and Appendices B and H) and offer the following comments and questions.

I-003-001 In what specific ways is the new Noise Monitoring System different from the old. In particular, what 1/3-octave band data are stored, and how often? Is there wind data available at the sites? Do all sites have 1/3-octave band data now?

I-003-002 How will the new system compute "aircraft-only" DNL?

I-003-003 The comparison between measured and modeled DNL for 2005 continues to show "errors" ranging from -3.2 dBA (Winthrop--Site 4) to +14.5 (Nahant--Site 18). While "average deviations" are discussed, it should be noted that there is no underprediction outside of 2.5 miles (per the chart)--Sites 3 and 16. To what does Massport attribute the wide range of errors in prediction close into the airport (-3.2 to +2.7 dBA)?

I-003-004 Why is the Winthrop highest measured site, #4, off by 3 dB (a factor of two in operations)? Even if one uses the total measured DNL, it is still off by 2.4 dB!

I-003-005 Has Massport statistically analyzed the meaning of the deviations reported each year?

I-003-001

Specific ways in which the new system is different from the old are described below.

Massport's contract for the replacement noise and operations monitoring system (NOMS) calls for a NOMS that incorporates state-of-the-art capabilities that will improve the accuracy, efficiency, usefulness, reliability, and user-friendliness of system operation. Principal related objectives identified in the contract include that Massport:

- Replace central computer components with modern hardware and Windows operating systems compatible with Massport Information Systems standards.
- Obtain a system from an active vendor, to ensure continued access to upgrades and advances.
- Improve the automation and efficiency of system operation, in particular the complaint-management process.
- Integrate the upgraded NOMS into the Massport computer network, to permit controlled access by staff in multiple departments.
- Improve mapping capabilities.
- Simplify maintenance and technical support.
- Increase the speed, accuracy, and responsiveness of complaint replies.
- Consider options to enhance current web-based flight track replay capabilities, such as improved base maps, simultaneous noise-level replay (time-history plots desired), simultaneous audio replay, etc...
- Provide public access to selected data summaries via the web, such as runway use, operations counts, etc.
- Improve the quality and appearance of material for public presentations.
- Meet or exceed the accuracy of the existing system's processing.

The prior monitoring system collected 1/3-octave band data at 13 of the

I-003-006 Has enforcement of Massport's Noise Rules resulted in any prosecuted violations in the last five (5) years? If so, how many and for what?

I-003-007 Does Massport observe aircraft not following the proper procedures, and alert the FAA and/or the airline for possible remedial action?

I-003-008 Does Massport have any plans to use "hush-houses" for engine run-ups, noise-abatement departure procedures, or other means to further reduce the noise in the community?

I-003-009 Are jet departures on Runway 27 in their "final" configuration, or is it still in review? The presentation of data in the Flight Track Monitoring Report would imply it is final.

I-003-010 It is disturbing to observe that more operations are occurring in the nighttime hours. A statement was made that an average of 25 operations occur at night. Assuming half arrivals and departures, that could be a dozen awakenings in a night at some locations.

For flights before 7 am, it is nearly impossible to get to the airport by MBTA. A person with an early flight is forced to use a cab.

I-003-011 Persistance and dwell were computed starting with the beginning of PRAS (Preferential Runway Advisory System) in 1980. It is only the reporting that is new.

I-003-012 When comments are made in the text comparing two or more years' worth of data, the supporting data should have been included in the tables of the current document. In particular, comparisons of mulitiple year data were missing for the following: Measured and measured vs. modeled noise data, time above, and complaints (Appendix H).

Thank you for giving me the opportunity to comment on this report.

Sincerely,

Nancy S. Timmerman, P.E.

cc: J. Wilkins

Letter to MEPA Office/EOEA #3247--2005EDR

30 noise monitors in the Airport environs. The noise monitors that were installed at all 30 locations are capable of collecting 1/3-octave band data on ½- or 1-second intervals during noise events (with events based on user-defined noise level and duration triggers).

The replacement system will collect wind velocity (speed and direction) at 18 of the monitoring sites.

I-003-002

Information on the algorithm used to calculate aircraft noise is proprietary and is therefore not available.

I-003-003

Of the 14 sites close to the Airport, six are within 1 dBA of the measured value and eight are within 1.5 dBA of the measured value. The average deviation at these sites is 1.4 dBA with Sites 4 and 6 having the largest deviations. The sites that are the closest to the Airport are influenced by several additional factors that sites away from the Airport (primarily measuring or modeling aircraft in flight) do not. The sites closest to the Airport are more likely influenced by multiple events, such as overwater propagation issues, taxiing aircraft etc. Massport is working towards reducing the discrepencies at these sites with the installation of the new monitoring system and improvements in the modeling process.

I-003-004

Site 4 is directly off the end of Runway 9-27 and is subject to arrivals to Runway 27 and departures from Runway 9. With the installation of the new monitoring system and the continued use of the RealContours™ system utilized in the *2005 EDR*, Massport expects to reduce these discrepancies.

I-003-005
Massport has not statistically analyzed the meaning of the deviations. However, Massport has worked to improve its modeling of the noise environment and with the addition of the new monitoring system, Massport will have an improved dataset to evaluate differences.

I-003-006
Enforcement of the Noise Rules have not resulted in any prosecuted violations over the last five years. Massport's Noise Office continues to monitor flights to identify violations of the Noise Rules.

I-003-007
Massport communicates with the Federal Aviation Administration (FAA) and appropriate Airport users when a specific flight does not achieve the desired noise abatement procedure.

I-003-008
Massport does not have any plans to use "hush-houses" at this time. The FAA is currently conducting the Boston Overflight Noise Study (BONS), which is looking at ways to reduce noise within the community from aviation sources.

I-003-009
The Record of Decision (ROD) for Runway 27 was issued in 1996. Since then, several studies have examined aircraft conformance to the designated flight corridor, resulting in minor adjustments to some of the navigational aids. FAA is still monitoring the Runway 27 corridor and will examine the corridor as part of the BONS.

I-003-010
Airlines continuously alter their flight schedules and Massport

encourages them to use the Airport during daytime hours. While there has been an increase in nighttime flights, the majority of these flights are using newer, quieter aircraft.

I-003-011

Persistence and Dwell were setup as part of the original Preferential Runway Assignment System (PRAS) system. The information was used as a reporting tool for the Massport Noise Office. They were presented as part of the analysis for the Logan Airside Project Environmental Impact Statement (EIS) and are now reported in the EDRs and Environmental Status and Planning Reports (ESPRs) as part of Massport's commitments to the Logan Airside Project EIS.

I-003-012

The EDRs provide a snapshot of annual conditions for comparison with previous year's data. In some cases, where appropriate, additional years are examined for trends.

C

Proposed Scope for the 2007 EDR

PROJECT NAME:	*Logan Airport 2007 Environmental Data Report* (*2007 EDR*)
PROJECT LOCATION:	East Boston, Massachusetts
EOEEA NUMBER:	3247
PROJECT PROPONENT:	Massachusetts Port Authority (Massport)

Massport respectfully submits this proposed Scope for the *Logan Airport 2007 Environmental Data Report* (*2007 EDR*) for public review and comment.

Purpose of the *Logan Airport 2007 Environmental Data Report*
The *2007 EDR* will provide an annual update on conditions at Logan Airport for calendar year 2007. The EDR will continue to serve as a background/context against which projects at Logan Airport can be evaluated. It also will report on the cumulative effects of Logan Airport operations and activities, compared to 2006.

Contents of the *2007 Environmental Data Report*
The *2007 EDR* will report on 2007 passenger and aircraft operation activity levels. This will be followed by a status report on Massport's proposed planning initiatives and projects. The technical reports in the Environmental Data Report will include indicators of noise, ground access, air quality, water quality, environmental compliance and project mitigation tracking. Each chapter's contents are described below.

1. Introduction/Executive Summary

This chapter of the *2007 EDR* will include:

- Overview of Logan Airport and place it in its environmental, geographic, and regulatory context
- Overview of the EDR/Environmental Status and Planning Report (ESPR) cycle
- Summary of activity levels and operations
- Overview of the Logan Airport planning initiatives and projects

- Summary of regional and ground transportation, noise, air quality, and water quality/environmental compliance
- Overview of sustainability initiatives at Logan Airport
- Description of the organization of the *2007 EDR*

2. Activity Levels

A primary purpose of this chapter will be to report on airport activity levels for 2007, including:

- Aircraft operations, including fleet mix and scheduled airline services at Logan Airport
- Passenger activity levels
- Cargo and mail
- Compare 2007 aircraft operations, cargo/mail operations, and passenger activity levels to 2006 activity levels
- Report on national aviation trends in 2007 and compare to trends at Logan Airport

3. Airport Planning

Massport continues to assess planning strategies for improving Logan Airport's operations and services in a, safe, secure, more efficient, and environmentally sensitive manner. As owner and operator of Logan Airport, Massport also must accommodate and guide tenant development. This chapter will describe the status of planning initiatives for the following areas:

- Terminal Area
- Airside Area
- Service and Cargo Areas
- Airport Buffers and Landscaping

The chapter also will report on the status of public works projects implemented by other agencies within the boundaries of Logan Airport.

4. Regional Transportation Context

The *2007 EDR* will describe Logan Airport's role in the region's intercity transportation system by reporting on the following:

<u>Regional Airports</u>

- 2007 regional airport operations, passenger activity levels, and schedule data within an historical context
- Status of plans and new improvements as provided by the regional airport authorities
- Ground Access improvements to the regional airports
- The role that Worcester Regional Airport and Hanscom Field play in the regional aviation system and Massport's efforts to promote these airports

Regional Transportation System

- Massport's efforts in strengthening the regional transportation system
- Massport's cooperation with other transportation agencies to promote efficient regional highway and transit operations
- Report on metropolitan and regional rail initiatives and ridership

5. Ground Transportation

The chapter will report on 2007 conditions and provide a comparison of 2007 findings to those of 2006 for the following:

- High occupancy vehicle (HOV) ridership (including Blue Line, Silver Line, Scheduled, Unscheduled, Water Transportation, and Logan Express)
- Logan Airport Employee Transportation Management Association (Logan TMA) membership and services
- Logan Airport gateway volumes
- On-airport traffic volumes
- On-airport vehicle miles traveled (VMT). VMT will be calculated using the updated model created in 2004 that is based on the full build roadway network
- Parking demand and management (including rates and duration statistics)
- Ground access management strategy
- Passenger and employee surveys

6. Noise Abatement

This chapter will provide an overview of the environmental regulatory framework affecting aircraft noise, the changes in aircraft noise, and the updates in noise modeling. The chapter will report on 2007 conditions and compare 2007 conditions to those of 2006 for the following:

- Fleet Mix, including Stage II, Recertified (Hushkitted) Stage III, newly manufactured Stage III, and any qualifying Stage IV aircraft
- Nighttime operations
- Runway utilization (report on aircraft and airline adherence with runway utilization goals)
- Preferential runway advisory system (PRAS) compliance
- Flight tracks, including a discussion of the update on the Standard Terminal Automation Replacement System (STARS) radar and consolidation of the Boston Terminal Radar Approach Control (TRACON) at Merrimac, plus Massport's installation and use of PASSUR data

The chapter will report on 2007 conditions and compare those to 2006 conditions for the following noise indicators:

- Using the Federal Aviation Administration's (FAA) most current version of the Integrated Noise Model (INM), and RealContours™ and RealProfiles™, produce an accurate set of Day-Night Sound Level (DNL) noise contours. Adjustments made to account for over-water sound propagation and the propagation of sound to areas of higher terrain will be reported
- Noise-impacted population

- Measured versus modeled noise values, including reasons for differences and any improvements attributable to the use of RealContours™ and RealProfiles™
- Cumulative Noise Index (CNI)
- Times-Above for 65, 75, and 85 dBA threshold values
- Installation and benefits of the new noise monitoring system
- Flight track monitoring noise quarterly reports

The chapter will also report on noise abatement efforts and provide a status update on the new noise and operations monitoring system.

7. Air Quality/Emissions Reductions

This chapter will begin with an overview of the environmental regulatory framework affecting aircraft emissions, changes in aircraft emissions, and the changes in air quality modeling. The chapter will discuss analysis methodologies and assumptions and report on 2007 conditions using the most recent versions of the Emissions Dispersion Modeling System (EDMS) and MOBILE motor vehicle emissions. The chapter will include:

- Emissions inventory for carbon monoxide (CO)
- Emissions inventory for oxides of nitrogen (NO_x)
- Emissions inventory for volatile organic compounds (VOCs)
- Emissions inventory for particulate matter (PM)
- Nitrogen dioxide (NO_2) monitoring
- NO_x emissions by airline

This chapter will also report on the following air quality initiatives (AQI) for 2007:

- Air Quality Initiative Tracking
- Massport's and Tenant's Alternative Fuel Vehicle Programs
- The status of other Logan Airport air quality studies undertaken by Massport or others

In response to the draft Greenhouse Gas (GHG) Emissions Policy and Protocol (the Protocol) recently issued by the Executive Office of Energy and Environmental Affairs, Massport will prepare an emission inventory of GHG at Logan International Airport. For this assessment, GHG emissions will be quantified for aircraft, GSE, motor vehicles and stationary sources using emission factors and methodologies outlined in the forthcoming final MEPA policy.

Massport will conduct an inventory of its fleet of alternative fuel vehicles and will report on the findings in this chapter of the *2007 EDR*.

8. Water Quality/Environmental Compliance and Management

This chapter will report on the 2007 status of:

- National Pollutant Discharge Elimination System (NPDES) Permit and monitoring results for Logan Airport's outfalls and the Fire Training Facility
- Jet fuel usage and spills
- Massachusetts Contingency Plan (MCP) Activities
- Tank Management
- Update on the environmental management plan

The chapter will also present a discussion of the following topics:

- Fuel spill prevention
- Future stormwater management improvements (if any)
- Future MCP and tank management activities

9. Project Mitigation Tracking

This chapter will report on the status of mitigation commitments for specific Massport and tenant projects at Logan Airport that have undergone Massachusetts Environmental Policy Act (MEPA) review and have commenced construction. The mitigation commitments were made in the Section 61 Findings for the following projects will be reported:

- West Garage/Central Garage
- International Gateway (Terminal E)
- Runway Ends 22R and 33L Safety Enhancements
- Replacement Terminal A
- Logan Airside Improvements Planning
- Runway Safety Area (RSA) Shellfish Relocation Plan

This chapter will update the status of Massport's mitigation commitments and also will identify projects for which mitigation is complete. Those completed projects will not be reported on in subsequent EDRs.

Appendices

MEPA Documentation

These appendices will include a copy of the Secretary's Certificate and comment letters received on the *2006 EDR*. Individual responses to items raised in the Secretary's Certificate on the *2006 EDR* and comments in reviewers' letters will be provided. A distribution list for the *2007 EDR* (indicating those receiving documents or CDs) will be provided.

Supporting Technical Documentation

Supporting technical appendices will be provided as necessary.

D

Distribution

This *2006 Environmental Data Report* (*2006 EDR*) has been distributed to federal, state, and city agencies and to parties listed in this appendix. The list includes those entities that the Massachusetts Environmental Policy Act (MEPA) requires as part of the review of the document, representatives of governmental agencies, commentors on the *2005 EDR*, and community groups concerned with airport activities.

The *2006 EDR* also is available on Massport's website at www.massport.com and electronically on compact disc (CD). Limited CD or printed copies of the *2006 EDR* may be requested from Jacki Wilkins, Senior Project Manager, Massport, Suite 200S, Logan Office Center, One Harborside Drive, East Boston, MA 02128, telephone (617) 568-3507, e-mail: jwilkins@massport.com.

Printed and electronic copies of this report are available for review at the following public libraries:

Table D-1 Libraries

Library	Address	Library	Address
[P,C] Boston Public Library Main Branch	666 Boylston Street Boston, MA 02117	[P,C] Boston Public Library Charlestown Branch	179 Main Street Charlestown, MA 02129
[P,C] Boston Public Library Connolly Branch	433 Centre Street Jamaica Plain, MA 02130	[P,C] Boston Public Library East Boston Branch	276 Meridian Street East Boston, MA 02128
[P,C] Boston Public Library Orient Heights Branch	18 Barnes Avenue East Boston, MA 02128	[P,C] Boston Public Library South Boston Branch	646 East Broadway South Boston, MA 02127
[P,C] Bedford Public Library	7 Mudge Way Bedford, MA 01730	[P,C] Cary Memorial Library	1874 Massachusetts Avenue Lexington, MA 02420
[P,C] Chelsea Public Library	569 Broadway Chelsea, MA 02150	[P,C] Concord Public Library	129 Main Street Concord, MA 01742
[P,C] Lincoln Public Library	Bedford Road Lincoln, MA 01773	[P,C] Milton Public Library Main Branch	476 Canton Avenue Milton, MA 02186
[P,C] Quincy Public Library Thomas Crane Branch	40 Washington Street Quincy, MA 02169	[P,C] Revere Public Library	179 Beach Street Revere, MA 02151
[P,C] Winthrop Public Library	One Metcalf Square Winthrop, MA 02151	[P,C] State Transportation Library	10 Park Plaza Boston, MA 02116-3973

C CD sent
P Printed volume sent

Some parties listed in Table D-2 have been provided a hard copy of the document along with a CD of the complete document. A second group of parties have been provided with a CD only.

Table D-2 Distribution

Commentors on the 2005 EDR

[P] Representative Robert A. DeLeo Massachusetts State House, room 248 Boston, MA 02133	[P] Bryan Glascock Director City of Boston Environment Department Room 805 1 City Hall Plaza Boston, MA 02201	[P] Robert D'Amico Senior Planner Boston Transportation Department One City Hall Plaza, Room 721 Boston, MA 02201
[P] Stephen H. Kaiser, Ph.D. 191 Hamilton Street Cambridge, MA 02139	[P] Joseph Felzani 42 Goodwin Ave Point of Pines Revere, MA 02151	[P] Nancy S. Timmerman, P.E. Consultant in Acoustics and Noise Control 25 Upton Street Boston, MA 02218

Federal Government

- **United States Senators and Representatives**

[C] U.S. Representative Michael E. Capuano 110 First Street Cambridge, MA 02141	[C] Clerk of the House of Representatives Office of the 5th Congressional District of MA 11 Kearney Square Lowell, MA 01852	[C] U.S. Representative Barney Frank 29 Crafts Street Newton, MA 02158
[C] U.S. Representative William Delahunt 1250 Hancock Street, Suite 802-N Quincy, MA 02169	[C] U.S. Representative John Tierney 17 Peabody Square Peabody, MA 01960	[C] U.S. Senator Edward M. Kennedy 2400 J.F. Kennedy Federal Building Room 409 Boston, MA 02203
[C] U.S. Representative Edward J. Markey Five High Street, Suite 101 Medford, MA 02155	[C] U.S. Representative James McGovern 34 Mechanic Street, 1st Floor Worcester, MA 01608	[C] U.S. Senator John F. Kerry One Bowdoin Square, 10th Floor Boston, MA 02114
[C] U.S. Representative Steven Lynch 88 Black Falcon Terminal Suite 340 Boston, MA 02210		

- **Environmental Protection Agency**

[C] Elizabeth Higgins Congram Director, Office of Environmental Review U.S. Environmental Protection Agency New England Region One Congress Street Boston, MA 02114	[C] Lucy Edmondson Chief of Operations U.S. Environmental Protection Agency New England Region One Congress Street, Suite 1100 Boston, MA 02114	[C] Tim Timmerman U.S. Environmental Protection Agency New England Region One Congress Street, Suite 1100 Boston, MA 02114-2023

Table D-2 Distribution (continued)

■ Federal Aviation Administration

[C] Amy Corbett
New England Regional Administrator
Department of Transportation
Federal Aviation Administration
New England Region
12 New England Executive Park, Box 510
Burlington, MA 01803

[P,C] John Silva
Manager, Environmental Programs
Department of Transportation
Federal Aviation Administration
New England Region
12 New England Executive Park, Box 510
Burlington, MA 01803

[C] Bettina Perronti
Tower Manager
Department of Transportation
Federal Aviation Administration
Logan International Airport
600 Control Tower, 19th Floor
East Boston, MA 02128

[C] Ralph Nicosia-Rusin
Capacity Program Manager
Department of Transportation
Federal Aviation Administration
New England Region, Airports Division
12 New England Executive Park, Box 510
Burlington, MA 01803

[P,C] Laverne Reid
Manager, Airports Division
Department of Transportation
Federal Aviation Administration
New England Region, Airports Division
12 New England Executive Park, Box 510
Burlington, MA 01803

[C] Gary Hofnagle
Department of Transportation
Federal Aviation Administration
Boston Air Traffic Control Tower
Logan International Airport
600 Control Tower, 19th Floor
East Boston, MA 02128

■ United States Army Corps of Engineers

[C] Colonel Thomas L. Koning
Division Engineer
U.S. Army Corps of Engineers
New England District
696 Virginia Road
Concord, MA 01742-2751

■ United States Postal Service

[C] Dale Bierstaker
Support Services
United States Postal Service
GMF, Room 203
Boston, MA 02205-9991

■ United States Fish and Wildlife Service

[C] Dr. Mamie Parker
Assisting Regional Director
U.S. Fish and Wildlife Service
Department of the Interior
300 Westgate Center Drive
Hadley, MA 01035-9589

[C] NE Field Office
U.S. Fish and Wildlife Service
Department of the Interior
70 Commercial St., Suite 300
Concord, NH 03301-5087

State Government

■ Department of Environmental Protection

[C] Laurie Burt
Commissioner
Department of Environmental Protection
1 Winter St.
Boston, MA 02108

[C] Nancy Baker
MEPA Coordinator
Northeast Regional Office
Department of Environmental Protection
205B Lowell Street
Wilmington, MA 01887

[C] Rachel Freed
Section Chief
Wetlands and Waterways - NERO
Department of Environmental Protection
205B Lowell Street
Wilmington, MA 01887

[C] Iris Davis
Bureau of Waste Site Cleanup
Section Chief
Permits/Risk Reduction - NERO
Department of Environmental Protection
205B Lowell Street
Wilmington, MA 01887

[C] Jerome Grafe
Department of Environmental Protection – BWP
1 Winter Street, 10th Floor
Boston, MA 02108

[C] Christine Kirby
Transportation Programs
Department of Environmental Protection
One Winter Street, 9th Floor
Boston, MA 02108

Table D-2 Distribution (continued)

- **Senate/House of Representatives**

[C] Senate President Therese Murray
Massachusetts State House, Room 330
Boston, MA 02133

[C] Senator Steven Baddour
Massachusetts State House, Room 513
Boston, MA 02133

[C] Senator Jarrett T. Barrios
Massachusetts State House, Room 309
Boston, MA 02133

[C] Senator John A. Hart
Massachusetts State House, Room 109C
Boston, MA 02133

[C] Senator Robert A. Havern, III
Massachusetts State House, Room 109D
Boston, MA 02133

[C] Speaker Salvatore DiMasi
Massachusetts State House, Room 356
Boston, MA 02133

[C] Representative Joseph C. Wagner
Massachusetts State House
Room 134
Boston, MA 02133

[C] Representative Martha Walz
Massachusetts State House, Room 443
Boston, MA 02133

[C] Representative Kathi-Anne Reinstein
Massachusetts State House, Room 167
Boston, MA 02133

[C] Representative Eugene L. O'Flaherty
Massachusetts State House, Room 136
Boston, MA 02133

[C] Senator Anthony Petruccelli
Massachusetts State House, Room 413B
Boston, MA 02133

[C] Representative Brian Wallace
Massachusetts State House, Room 472
Boston, MA 02133

[C] Representative Byron Rushing
Massachusetts State House, Room 481
Boston, MA 02133

- **Executive Office of Energy and Environmental Affairs**

[P,C] Ian Bowles
Secretary
Executive Office of Energy and Environmental Affairs
100 Cambridge St, 9th Floor
Boston, MA 02114

[P,C] Deerin Babb-Brott, Director
MEPA Office
Executive Office of Environmental Affairs
100 Cambridge St, 9th Floor
Boston, MA 02114

[P,C] Anne Canaday
Environmental Analyst
Executive Office of Environmental Affairs
100 Cambridge St, 9th Floor
Boston, MA 02114

- **Department of Public Health**

[C] Suzanne K. Condon
Associate Commissioner
Executive Office of Health and Human Services
Dept. of Public health
250 Washington Street
Boston, MA 02108

- **Department of Conservation and Recreation**

[C] Rick Sullivann
Commissioner
Dept. of Conservation and Recreation
251 Causeway Street, Suite 600
Boston, MA 02114-2104

[C] Priscilla E Geiges, Director
Division of State Parks
Department of Conservation and Recreation
251 Causeway Street, Suite 600
Boston, MA 02114

Table D-2 Distribution (continued)

- **Department of Fisheries, Wildlife and Environmental Law Enforcement**

[C] Environmental Reviewer
Mass. Wildlife &
Environmental Law Enforcement
Field Headquarters Rte. 135
Westborough, MA 01581

- **Department of Housing and Community Development**

[C] Debra Jean
Coordinator, State Clearinghouse
Dept. of Housing and Community Development
One Congress Street, Suite 1001
Boston, MA 02114-2023

- **Massachusetts Water Resources Authority**

[C] Pam Heidell
Executive Director
Mass. Water Resources Authority
Charlestown Navy Yard
100 First Avenue
Charlestown, MA 02129

- **Coastal Zone Management**

[C] Leslie-Ann McGee
Director
Massachusetts Office of Coastal Zone Management
EOEA
251 Causeway St. Suite 900
Boston, MA 02114-2119

- **Executive Office of Transportation**

[C] Bernard Cohen
Secretary
Executive Office of Transportation and Construction
10 Park Plaza, Suite 3170
Boston, MA 02116

- **Central Transportation Planning Staff**

[C] Robin Mannion
Deputy Director
Modeling Activities
Central Transportation Planning Staff
10 Park Plaza, Room 2150
Boston, MA 02116

- **Massachusetts Aeronautics Commission**

[C] Robert E. Welch, Jr.
Executive Director
Mass. Aeronautics Commission
10 Park Plaza, Room 6620
Boston, MA 02116

- **Massachusetts Bay Transportation Authority**

[C] Andrew Brennan
Environmental Affairs
Mass. Bay Transportation Authority
10 Park Plaza, Room 3910
Boston, MA 02116

- **Massachusetts Highway Department**

[C] Luisa Paiewonsky
Commissioner
Massachusetts Highway Department
10 Park Plaza, Room 3510
Boston, MA 02116

[C] Jessica Kenny
MEPA/NEPA Coordinator
Massachusetts Highway Department
10 Park Plaza, Room 4260
Boston, MA 02116

- **Metropolitan Area Planning Council**

[P,C] Steve McGoldrick
Deputy Executive Director
Metropolitan Area Planning Council
60 Temple Place, 6th Floor
Boston, MA 02111

- **Massachusetts Turnpike Authority**

[C] Ronald Killian
Environmental Permits Manager
Central Artery/Tunnel Project
Massachusetts Turnpike Authority
185 Kneeland Street
Boston, MA 02110

Table D-2 Distribution (continued)

■ Massachusetts Executive Office of Health and Human Services

[C] Margaret Round, Environmental Analyst
Massachusetts Department of Public Health
Center for Environmental Health
250 Washington Street, 7th Floor
Boston, MA 02108

■ Massachusetts Department of Public Safety

[C] Thomas G. Gatzunis
Commissioner
Massachusetts Department of Public Safety
One Ashburton Place
Boston, MA 02108

■ Massachusetts Port Authority Board of Directors

[C] John A. Quelch
Board Chairman
Massachusetts Port Authority
One Harborside Drive
East Boston, MA 02128-2909

[C] Ranch C. Kimball,
Board Member
Massachusetts Port Authority
One Harborside Drive
East Boston, MA 02128-2909

[C] Lois J. Catanzaro
Board Member
Massachusetts Port Authority
One Harborside Drive
East Boston, MA 02128-2909

[C] Paul Foster
Board Member
Massachusetts Port Authority
One Harborside Drive
East Boston, MA 02128-2909

[C] Paul J. McNally
Board Member
Massachusetts Port Authority
One Harborside Drive
East Boston, MA 02128-2909

[C] Frederic Mulligan
Board Member
Massachusetts Port Authority
One Harborside Drive
East Boston, MA 02128-2909

[C] Bernard Cohen
Board Member
Massachusetts Port Authority
One Harborside Drive
East Boston, MA 02128-2909

Municipalities

Office of the Mayor

[C] Thomas Menino
Mayor
City of Boston
One City Hall Square
Boston, MA 02201

Boston Transportation Department

[P,C] Tom Tinlin
Acting Commissioner
Boston Transportation Department
One City Hall Square, Room 721
Boston, MA 02201

Boston Redevelopment Authority

[P,C] Paul McCann
Acting Director
Boston Redevelopment Authority
One City Hall Square, Room 959
Boston, MA 02201

Boston Parks and Recreation Department

[C] Antonia Pollak
Commissioner
Boston Parks and Recreation Dept.
1010 Massachusetts Avenue
Boston, MA 02118

Table D-2 Distribution (continued)

Boston Public Health Commission

[C] Dr. Barbara Ferrer
Executive Director
Boston Public Health Commission
1010 Massachusetts Avenue
Boston, MA 02118

Environmental Services Cabinet

[C] Nancy Grilke
Environmental Services Cabinet Chief of Staff
City Hall, Room 603
Boston, MA 02201

[C] James Hunt
Chief of Environmental and Energy Services
City Hall, Room 603
Boston, MA 02201

Boston Water and Sewer Commission

[C] Vincent G. Mannering
Executive Director
Boston Water and Sewer Commission
980 Harrison Avenue
Boston, MA 02119

[C] John Lopes
Boston Water and Sewer Commission
980 Harrison Avenue
Boston, MA 02119

[C] Charlie Jewel
Boston Water and Sewer Commission
980 Harrison Avenue
Boston, MA 02119

City Clerk's Office

[C] Rosario Salerno
Boston City Clerk
One City Hall Square
Boston, MA 02201

Boston City Council

[C] Michael Flaherty
Councilor- At- Large,
Boston City Council
Boston, City Hall
Boston, MA 02201

[C] Robert Consalvo
District Councilor, 5
Boston City Council
Boston City Hall
Boston, MA 02201

[C] Maureen E. Feeney,
Council President
Boston City Council
Boston, City Hall
Boston, MA 02201

[C] Sam Yoon
Councilor-At-Large
Boston City Council
Boston, City Hall
Boston, MA 02201

[C] Bill Linehan
District Councilor, 2
Boston City Council
Boston, City Hall
Boston, MA 02201

[C] Stephen J. Murphy
Councilor-At-Large
Boston City Council
Boston, City Hall
Boston, MA 02201

[C] Felix Arroyo
Councilor-At-Large
Boston City Council
Boston, City Hall
Boston, MA 02201

[C] Michael Ross
District Councilor, 8
Boston City Council
Boston, City Hall
Boston, MA 02201

[C] Charles C. Yancey
District Councilor, 4
Boston City Council
Boston, City Hall
Boston, MA 02201

[C] John Tobin
District Councilor, 6
Boston City Council
Boston, City Hall
Boston, MA 02201

[C] Charles Turner
District Councilor, 7
Boston City Council
Boston, City Hall
Boston, MA 02201

[C] Jerry McDermott
District Councilor, 9
Boston City Council
Boston, City Hall
Boston, MA 02201

[C] Michael Ross
District Councilor, 8
Boston City Council
Boston, City Hall
Boston, MA 02201

[C] Sal LaMattina
District Councilor, 1
Boston City Council
Boston City Hall
Boston, MA 02201

Table D-2 Distribution (continued)

■ **Town of Milton**

C Marion McEttrick. Chair, Board of Selectmen Milton Town Hall 1475 Canton Avenue Milton, MA 02186	C Kevin Mearn Town Administrator Milton Town Hall 525 Canton Avenue Milton, MA 02186	

■ **City of Chelsea**

C Jay Ash City Manager Chelsea City Hall 500 Broadway Chelsea, MA 02150	C Calvin T. Brown Councilor District 7 500 Broadway Chelsea, MA 02150	C Ron D. Morgese Councilor District 8 500 Broadway Chelsea, MA 02150
C Robert Bishop City Clerk Chelsea City Hall 500 Broadway Chelsea, MA 02150	C Leo Robinson Councilor-At-Large 500 Broadway Chelsea, MA 02150	C Stephen Sarikas, Chairman Chelsea Conservation Commission Chelsea City Hall 500 Broadway Chelsea, MA 02150
C Paula S. Barton Councilor District 4 500 Broadway Chelsea, MA 02150	C Paul Nowicki, President Chelsea City Council 500 Broadway Chelsea, MA 02150	C Roseann T. Bongiovanni Councilor District 3 500 Broadway Chelsea, MA 02150
C Brian B. Hatleberg Councilor District 5 Chelsea City Hall 500 Broadway Chelsea, MA 02170	C Mike MeKonnen Tsegaye Councilor District 2 500 Broadway Chelsea, MA 02150	C John DePriest Chelsea Conservation Commission City of Chelsea 500 Broadway, Room 101 Chelsea, MA 02150
C Marilyn Vega-Torres Councilor District 6 Chelsea City Hall 500 Broadway Chelsea, MA 02150	C Luis Prado, MSPIH Director, Dept. of Health and Human Services Chelsea City hall 500 Broadway Chelsea, MA 02150	C Stanley Troisi Councilor District 1 500 Broadway Chelsea, MA 02150
C Councilor Roy A. Avellaneda Chelsea City Hall 500 Broadway Chelsea, MA 02150		

■ **City of Quincy**

C William J. Phelan Mayor Quincy City Hall 1305 Hancock Street Quincy, MA 02169	C Douglas S. Gutro President, City Council Quincy City Hall 1305 Hancock Street Quincy, MA 02169	C Joseph Shea City Clerk Quincy City Hall 1305 Hancock Street Quincy, MA 02169

■ **City of Revere**

C Thomas G. Ambrosino Jr., Mayor Revere City Hall 281 Broadway Revere, MA 02151	C John Henry, City Clerk Revere City Hall 281 Broadway Revere, MA 02151	

Table D-2 Distribution (continued)

- **Town of Winthrop**

C Richard White
Town Manager
Winthrop Town Hall
One Metcalf Square
Winthrop, MA 02152

C Richard Dimes
Winthrop Planning Board
Winthrop Town Hall
One Metcalf Square
Winthrop, MA 02152

C Jerome Falbo
Town of Winthrop Air Pollution, Noise and Airport Hazards Committee
80 Jefferson Street
Winthrop, MA 02152

C Mary Kelley Chair,
Winthrop Conservation Commission
Winthrop Town Hall
One Metcalf Square
Winthrop, MA 02152

C Thomas Reilly
Council President
Winthrop Town Hall
One Metcalf Square
Winthrop, MA 02152

C Joseph Ferrino
Councilor-At-Large
Winthrop Town Hall
One Metcalf Square
Winthrop, MA 02152

C Phillip Boncore
V.P., Councilor-At-Large
Winthrop Town Hall
One Metcalf Square
Winthrop, MA 02152

C Richard Gill
Councilor- Precinct 1
Winthrop Town Hall
One Metcalf Square
Winthrop, MA 02152

C James Letterie
Councilor- Precinct 2
Winthrop Town Hall
One Metcalf Square
Winthrop, MA 02152

C Nicholas DelVento
Councilor- Precinct 3
Winthrop Town Hall
One Metcalf Square
Winthrop, MA 02152

C Jeanne Maggio
Councilor- Precinct 4
Winthrop Town Hall
One Metcalf Square
Winthrop, MA 02152

C Russell Sanford
Councilor- Precinct 5
Winthrop Town Hall
One Metcalf Square
Winthrop, MA 02152

C Linda Calla
Councilor- Precinct 6
Winthrop Town Hall
One Metcalf Square
Winthrop, MA 02152

- **Town of Bedford**

C Sheldon Moll, Chair
Board of Selectmen
Town of Bedford
10 Mudge Way
Bedford, MA 01730

C Richard T. Reed
Town Manager
Town of Bedford
10 Mudge Way
Bedford, MA 01730

C Gordon Feltman
Board of Selectmen, HFAC Rep.
Town of Bedford
10 Mudge Way
Bedford, MA 01730

- **Town of Lexington**

C Jeanne Krieger
Board of Selectmen
Lexington Town Hall
1625 Massachusetts Avenue
Lexington, MA 02173

C Hank Manz
Board of Selectmen, HFAC Rep.
Lexington Town Hall
1625 Massachusetts Avenue
Lexington, MA 02173

C Carl Valente
Town Manager
Lexington Town Hall
1625 Massachusetts Avenue
Lexington, MA 02173

- **Town of Concord**

C Anne D. Shapiro
Chair
Concord Board of Selectmen
34 Tarbell Spring Road
Concord, MA 01742

C Christopher Whelan
Town Manager
Town of Concord
22 Monument Square
Concord, MA 01742

Table D-2 Distribution (continued)

- **Town of Lincoln**

C Sara Mattes
Selectmen, Town of Lincoln
Hanscom Area Town Selectmen
7 Conant Road
Lincoln, MA 02173

C Timothy Higgins
Town Administrator
Town Hall
16 Lincoln Road
Lincoln, MA 01773

C Sarah Cannon Holden
Board of Selectmen, HFAC Rep.
Town Hall
16 Lincoln Road
Lincoln, MA 01773

- **Town of Hull**

C Christopher Olivieri
Hull Board of Selectman, Town Hall
253 Atlantic Avenue
Hull, MA 02045

C Phillip LemnoisTown Manager
253 Atlantic Avenue
Hull, MA 02045

Community Groups and Interested Parties

- **Citizens Advisory Committee (CAC)**

C Dovi Abbey
4 Humboldt Avenue
Roxbury, MA 02119

C Gary Banks
128 Indian Trail
Scituate, MA 02066

C Declan Boland
338 Main Street
Hingham, MA 02043

C Charles R. Borgioli
89 Bank Road
Swampscott, MA 01907-2047

C Larry Costello
100 Furbush Road
West Roxbury, MA 02132

C Ralph Dormitzer
111 Atlantic Avenue
Cohasset, MA 02025

C Jerry Falbo
80 Jefferson Street
Winthrop, MA 02152

C Bill Galvin
P. O. Box 209302
Charlestown, MA 02129

C Alex Geourntas
39 Iona Street
Roslindale, MA 02131

C Ron Hardaway
118 Bayswater Street
East Boston, MA 02128-1244

C Blossom Hoag
177 Webster Street
East Boston, MA 02128

C Sandra Kunz, Co-Chair
89 Hollingsworth Avenue
Braintree, MA 02184

C Steve Lathrop
14 Western Avenue
Hull, MA 02045

C James MacDonald
29 Arlington Road
Dedham, MA

C Bernice Mader
108 Connell Street
Quincy, MA 02169

C Marianne McCabe
3 Webster Square
PMB 333
Marshfield, MA 02050

C Daniel McCormack
Weymouth Town Hall (Health Department)
75 Middle Street
Weymouth, MA 02189

C Joseph Moccia
73 Little Nahant Road
Nahant , MA01908

C Dick Morrison
Morrison Market Strategies
34 Tremont Street
Chelsea, MA 02150-2661

C Kristen O'Brien
45 Badger Circle
Milton, MA 02186

P,C Jim Page
162 Endicott Avenue
Revere, MA 02151

C Darryl Pomicter
136 Myrtle Street
Boston, MA 02114

C Pam Smith
One Barma Road
Dorchester, MA02124

C John Stewart
(South End)
37 Greenwich Park
Boston, MA 02118

Table D-2 Distribution (continued)

[C] Mona Thaler
22 Cushing Road
Brookline, MA 02146

[C] Leo White
12 Stewart Lane
Beverly, MA 01915-1112

[C] Wig Zamore
13 Highland Avenue #3
Somerville, MA 02143

[C] Bob Driscoll
179 Grovers Avenue
Winthrop, MA 02125

[C] Mary Anne Frye
2 Beach Lane
Hingham, MA 02043

[C] David Godine
196 School Street
Milton, MA 02186

[C] Will Lyman
18 Greenough Avenue
Jamaica Plain, MA 02130

[C] Mat MacIver
25 Colonial Road
Hingham, MA 02043

[C] Bill Manning
1 Webster Street
East Boston, MA 02128

[C] Jean McCullough
105 Little Nahant Road
Nahant, MA 01908

[C] Marty Nee
109 Atlantic Avenue
Cohasset, MA 02025

[C] Michael Parker
Flagship Unit 515
197 8th Street
Charlestown, MA 02129

[C] Sandy Steele
Hoffman & Hoffman, LLP
44 School Street, 6th Floor
Boston, MA 02108

[C] Allison Stieber
14 Wyatt Street
Somerville, MA 02143

[C] Alan Wright
57 Arborough Road
Roslindale, MA 02131

[C] Rod Hobson
31 Deep Run
Cohasset, MA 02025

[C] Frederick Salvucci
MIT Building One
77 Massachusetts Avenue
Cambridge, MA 02139

- **Charlestown Community**

[C] Tom Cunha
Chair
Charlestown Neighborhood Council
427 Bunker Hill Street
Charlestown, MA 02129

- **Chelsea Community**

[C] Juan Vega
Executive Director
Centro Hispano de Chelsea
267 Broadway
Chelsea, MA 02150

[C] Gladys Vega
Chelsea Greenspace
c/o Chelsea Human Services Collaborative
300 Broadway
Chelsea, MA 02150

[C] Michael Falzone
President
Chelsea Rotary
8 Central Avenue
Chelsea, MA 02150

[C] Susan E. Gallant
President
Chelsea Chamber of Commerce
308 Broadway
Chelsea, MA 02150

- **Jamaica Plain Community**

[C] Nancy Brooks and Maura Meagher
92 Bourne St
Jamaica Plain, MA 02130

[C] Marvin Kabakott
98 Bourne St
Jamaica Plain, MA 02130

[C] Martha Merson
19 Roseway St
Jamaica Plain, MA 02130

[C] Susan Morony
33 Bournedale Rd
Jamaica Plain, MA 02130

[C] Robyn Ochs
79 Eastland Road
Jamaica Plain, MA 02130

[C] Craig Sonnenberg
Aircraft Noise Action Committee
18 Southborne Road
Jamaica Plain, MA 02130

Table D-2 Distribution (continued)

- **East Boston Community**

[C] Thomas Briand, President
East Boston Residents &
Homeowners Assoc.
83 Byron Street
East Boston, MA 02128

[C] Karen Buttiglieri
56 Beachview Road
East Boston, MA 02128

[C] John Dudley
Executive Director
East Boston Chamber of Commerce
296 Bennington Street
East Boston, MA 02128

[C] Mary Catino
71 Liverpool Street
East Boston, MA 02128

[C] Debra Cave
ONE East Boston
106 White Street
East Boston, MA 02128

[C] Alice Christopher
972 Bennington Street
East Boston, MA 02128

[C] Dean Hashimoto
East Boston Neighborhood Health Center
153 Westchester Road
Newton, MA 02158

[C] Lucy Ferullo
23 Haynes Street
East Boston, MA 02128

[C] Tom Bruno
Orient Heights Neighborhood Association
51 Annavoy Street
East Boston, MA 02128

[C] Mary Ellen Welch
East Boston Greenways
225 Webster Street
East Boston, MA 02128

[C] Roberta Horn
65 St. Andrews Road
East Boston, MA 02128

[C] Ida Lamattina
President
Gove Street Citizens Committee
123 Cottage Street
East Boston, MA 02128

[P,C] William Longfield
201 Webster Street
East Boston, MA 02128

[C] George Loring
Bremen Street Park Site Committee
237 Marion Street
East Boston, MA 02128

[C] Karen Maddalena
Chairperson
Jeffries Point Neighborhood Assoc.
4 Lamson Street
East Boston, MA 02128

[C] James Manganello, Executive Director
East Boston Community Information &
Referral Center
237 Marion Street
East Boston, MA 02128

[C] Richard Lynds
Executive Director
East Boston Foundation
46 BenningtonStreet
East Boston, MA 02128

[C] Clark Moulaison
East Boston Main Streets
146 Maverick Street
East Boston, MA 02128

[C] Jean Reisman
188 Webster Street
East Boston, MA 02128

[C] Gail Miller
232 Orient Ave
East Boston, MA 02128

[C] Jack Scalcione
Commander
East Boston Veteran's Council
36 Frankfort Street
East Boston, MA 02128

[C] Lauri Webster
192 Gladstone Street
East Boston, MA 02128

[C] Fran Riley
193 Trenton Street
East Boston, MA 02128

[C] Fran Rowan
7 Thurston Street
East Boston, MA 02128

[C] Robert Verdonk, President
East Boston Savings Bank
10 Meridian Street
East Boston, MA 02128

[C] Vincent R. Tino
95 Faywood Avenue
East Boston, MA 02128

[C] Maria Conti
Secretary, EB Piers PAC
44 Saratoga Street
East Boston, MA 02128

[C] Ron Hardaway
118 Bayswater Street
East Boston, MA 02128

Table D-2 Distribution (continued)

- **Revere Community**

C Mr. John Addonizio
Board Director
Revere Chamber of Commerce
Fleet National Bank
330 Broadway
Revere, MA 02151

C Michael Callahan
265 Crescent Avenue
Revere, MA 02151

C James Furlong
Roughans Point Association
c/o 12 Pierview Street
Revere, MA 02151

C Elaine Hurley
Pines Riverside Association
c/o 21 River Avenue
Revere, MA 02151

C Joseph James
Friends of Rumney Marsh
10 Rice Avenue
Revere, MA 02151

C Michael Kelleher
Revere Beach Assoc.
681 Revere Beach Boulevard
Revere, MA 02151

C Sheldon Kovitz, President
Point of Pines Beach Assoc.
c/o 53 Delano Avenue
Revere, MA 02151

C Rose LaQuaglia
Oak Island Civic Association
5 Oak Island Road
Revere, MA 02151

C Carl Shalachman
72 Whitin Ave
Revere, MA 02151

C John J. Verrengia
CPCA, PC
President, Revere Chamber of Commerce
385 Broadway
Revere, MA 02151

- **Roslindale Community**

C Pauline Sickels-George
50 Halliday St
Roslindale, MA 02131

- **South Boston Community**

C Thomas McGrath
President
South Boston Citizens Association
South Boston, MA 02127

C Casey Flynn

Mayor's Office of Neighborhood Services
1 City Hall Plaza
Boston, MA 02201

C Maryann Crush
Chair, South Boston Betterment Trust
917 E. Broadway
South Boston, MA 02127

C Lucky Devlin
South Boston Environmental & Health Coalition
718 East Second Street
South Boston, MA 02127

C Timothy Hayes, Chair
"M" Street Park Association
23 "M" Street
South Boston, MA 02127

C Alice O'Leary
Publisher, South Boston Tribune
395 West Broadway
South Boston, MA 02127

C Seaport Alliance for a Neighborhood Design
300 Summer Street
Boston, MA 02210

C Mr. William Spain
President
Castle Island Association
1514 Columbia Road
South Boston, MA 02127

C Fran Collins
S. Boston Residents Group
P.O.Box 75
South Boston, MA 02127

Table D-2 Distribution (continued)

- **Winthrop Community**

C Eleanor Casey
308 Bowdoin Street
Winthrop, MA 02152

C Richard D. Dimes
Winthrop Hazards Committee
105 Johnson Ave.
Winthrop, MA 02152

C Conal Foley, President
Friends of Belle Isle Marsh
97 Lowell Road
Winthrop, MA 02152

C William Hayes
Vice-President
North Shore Rec. Center
40 River Road
Winthrop, MA 02152

C Tony Marmo
President
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E

Activity Levels

This appendix provides detailed tables and figures in support of *Chapter 2, Activity Levels*:

- Table E-1 Logan Airport Historic Air Passenger and Operations Data
- Figure E-1 Logan Airport Historic Air Passenger and Operations Data
- Table E-2 Logan Airport Changes in Domestic Passenger Operations by Carrier
- Table E-3 Logan Airport Changes in International Passenger Operations by Carrier
- Table E-4 Logan Airport Scheduled Passenger Departures by Destination

Table E-1	Logan Airport Historic Air Passenger and Operations Data				
Year	**Operations**	**Air Passengers**	**Year**	**Operations**	**Air Passengers**
1980	258,167	14,722,363	1993	493,093	23,579,726
1981	251,961	14,827,684	1994	458,623	24,468,178
1982	244,468	15,867,722	1995	466,327	24,192,095
1983	288,956	17,848,797	1996	456,226	25,134,826
1984	318,959	19,417,971	1997	482,542	25,567,888
1985	349,518	20,448,424	1998	507,449	26,526,708
1986	363,995	21,862,718	1999	494,816	27,052,078
1987	414,968	23,369,002	2000	487,996	27,726,833
1988	407,479	23,732,959	2001	463,125	24,474,930
1989	388,797	22,272,860	2002	392,079	22,696,141
1990	424,568	22,878,191	2003	373,304	22,791,169
1991	430,403	21,450,143	2004	405,258	26,142,516
1992	474,378	22,723,138	2005	409,066	27,087,905
			2006	**406,119**	**27,725,443**

Figure E-1 Logan Airport Historic Air Passenger and Operations Data

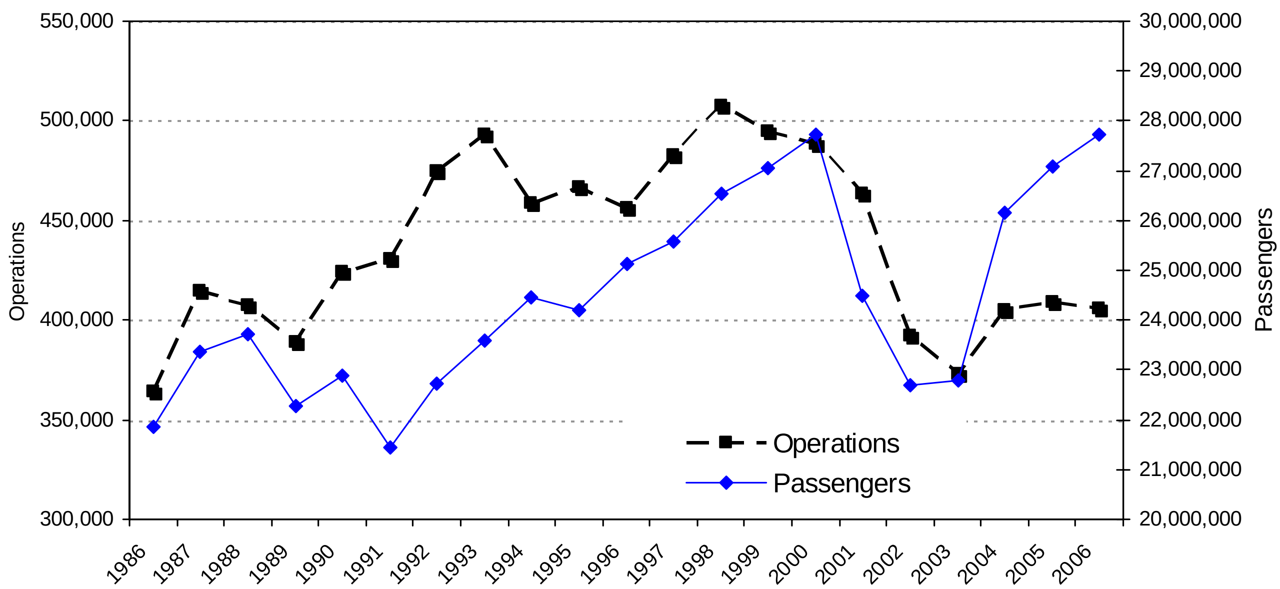


Table E-2 Logan Airport Changes in Domestic Passenger Operations by Carrier

Airline	2004	2005	2006	Change	Percent Change
Scheduled Jet Carriers					
AirTran Airlines	12,618	14,580	19,761	5,181	35.53%
Alaska Airlines	1,111	1,088	1,097	9	0.83%
America West Airlines	5,922	4,467	4,220	-247	-5.53%
American Airlines	32,578	27,712	24,631	-3,081	-11.12%
American Trans Air	2,342	2,294		-2,294	-100.00%
Continental Airlines	13,575	13,546	13,972	426	3.14%
Delta Air Lines Mainline	15,279	14,317	18,472	4,155	29.02%
Delta Shuttle	10,237	9,588	9,000	-588	-6.13%
Delta Song	11,693	12,483	4,408	-8,075	-64.69%
Delta Subtotal	37,209	36,388	31,880	-4,508	-12.39%
Independence Air	5,533	4,676	45	-4,631	-99.04%
JetBlue	9,080	15,069	31,993	16,924	112.31%
Midwest Express Airlines	2,851	3,570	4,287	717	20.08%
Northwest Airlines	11,242	9,685	8,652	-1,033	-10.67%
United Airlines	20,975	18,304	21,153	2,849	15.56%
US Airways	38,563	39,612	36,907	-2,705	-6.83%
Jet Subtotal	**193,599**	**190,991**	**198,598**	**7,607**	**3.98%**
Regional/Commuter Carriers					
ACJet (Delta Connection)	7,244				
ACJet (United Express)	1,038				
Air Wisconsin (United Express)	801	1,699		-1,699	-100.00%
Air Wisconsin (US Airways Express)		174	1,381	1,207	693.68%
Allegheny (US Airways Express)	1,789				
American Eagle Airlines	42,173	37,394	31,227	-6,167	-16.49%
Atlantic SE (Delta Connection)	362				
Cape Air	24,816	25,018	27,278	2,260	9.03%
Chautauqua Airlines (American Airlines)	1,533				
Chautauqua Airlines (Delta Connection)	2,116	1,938	1,882	-56	-2.89%
Chautauqua Airlines (United Express)		103		-103	-100.00%
Chautauqua Airlines (US Airways Express)	8,899	7,852	8,954	1,102	14.03%
Colgan Air (US Airways Express)	11,546	12,583	13,088	505	4.01%
Comair Airlines (Delta Connection)	15,732	24,619	26,341	1,722	6.99%
Commutair (Continental Express)	6,256	12,544	8,297	-4,247	-33.86%
Mesa Airlines (Signature)			8	8	
Mesa Airlines (United Express)	145	1,376	3,806	2,430	176.60%
Mesa Airlines (US Airways Express)	401	4	8	4	100.00%
MidAtlantic Express	380	150	130	-20	-13.33%
Piedmont Airlines	1,529	3,165	2,870	-295	-9.32%
Pinnacle Airlines (Northwest Airlink)	1,300	5,034	3,912	-1,122	-22.29%
PSA (US Airways Express)		526	246	-280	-53.23%
Republic (US Airways Express)		46	260	214	465.22%
Trans States Airlines (United Express)	52		610	610	
Trans States Airlines (US Airways Express)	1,756	2,978		-2,978	-100.00%
Regional/Commuter Subtotal	**130,272**	**137,203**	**130,298**	**-6,905**	**-5.03%**
Non-Scheduled Operations (Charter)					
Boston Main		13	12	-1	-7.69%
Champion Air		21	56	35	166.67%
Miami Air	34	30	52	22	73.33%
North American Airways	216	148	92	-56	-37.84%
OMNI Airlines		26	2	-24	-92.31%
XTRA			46	46	
Trans Meridian		2		-2	-100.00%
World Airways	14	8	2	-6	-75.00%
Other Nonscheduled Carriers	159	77	103	26	33.77%
Non-Scheduled Subtotal	**507**	**664**	**365**	**-299**	**-45.03%**
Total Domestic Operations	**324,378**	**328,858**	**329,261**	**403**	**0.12%**

Note: Excludes private general aviation and all-cargo operations.
Source: Massport.

Table E-3 Logan Airport Changes in International Passenger Operations by Carrier

Airline	2004	2005	2006	Change	Percent Change
Scheduled Jet Carriers					
Aer Lingus Shannon	1,096	1,016	1,020	4	0.39%
Aeromexico	649	534	210	-324	-60.67%
Air Canada	6,846	5,782	3,950	-1,832	-31.68%
Air France	1,362	1,334	1,207	-127	-9.52%
Air Jamaica	662	349		-349	-100.00%
Alitalia	894	986	810	-176	-17.85%
American Airlines	5,175	4,672	4,824	152	3.25%
British Airways	2,080	2,151	2,190	39	1.81%
Delta Air Lines	736	749	851	102	13.62%
Finnair		44	49	5	11.36%
Icelandair	892	811	807	-4	-0.49%
JetBlue			555	555	
SATA International Airlines	301	315	334	19	6.03%
Lufthansa German Airlines	1,526	1,564	1,522	-42	-2.69%
Northwest Airlines	730	727	734	7	0.96%
SWISS International (formerly Swiss Air)	714	704	708	4	0.57%
TACA	363	327	236	-91	-27.83%
TACV – Cabo Verde	157	154	139	-15	-9.74%
US Airways	2,048	1,607	1,208	-399	-24.83%
Virgin Atlantic Airways	860	724	727	3	0.41%
Jet Subtotal	**26,804**	**24,308**	**22,081**	**-2,227**	**-9.16%**
Regional/Commuter Carriers					
ACJet (Delta Connection)	1,688				
Air Canada Regional	5,060	5,120	7,676	2564	50.08%
American Eagle Airlines	3,306	4,637	2,712	-1,925	-41.51%
Comair (Delta Connection)	1,730	3,355	2,534	-821	-24.47%
Regional/Commuter Subtotal	**11,784**	**13,112**	**12,922**	**-182**	**-1.39%**
Non-Scheduled Operations					
American Trans Air	114	26	6	-20	-76.92%
Aviation Technology		160		-160	-100.00%
Boston Main		6		-6	-100.00%
Cayman Airways	7	55	60	5	9.09%
Champion Air		18	2	-16	-88.89%
LACSA Airlines	14	18	12	-6	-33.33%
Miami Air	14	18	63	45	250.00%
North American Airways	441	323	275	-48	-14.86%
OMNI Airlines		10		-10	-100.00%
Other Nonscheduled Carriers	49	21	11	-10	-47.62%
Pan American Airways	389				
Planet Airways		14		-14	-100.00%
Ryan International	115	303	143	-160	-52.81%
Saudi Arabian			10	10	
Trans Meridian	44	8		-8	-100.00%
Viet Nam Airlines		1		-1	-100.00%
XTRA Aviation			145	145	
Non-Scheduled Subtotal	**1,467**	**1,223**	**727**	**-496**	**-40.56%**
Total International Operations	**40,055**	**38,643**	**35,730**	**-2905**	**-7.52%**

Note: Both jet carriers and regional/commuter carriers scheduled and operated regional jet flights at Logan Airport in 2004, 2005, and 2006.
Source: Massport.

Table E-4 Logan Airport Scheduled Passenger Departures by Destination

Destination Airport	2004	2005	2006	2005-2006 Change	2005-2006 Percent Change
Domestic					
New York La Guardia	13,709	13,368	12,619	-749	-5.60%
Washington National	10,572	10,697	9,587	-1,110	-10.38%
New York JFK	4,070	4,981	8,839	3,858	77.45%
Chicago O'Hare	8,446	7,421	7,251	-170	-2.29%
Philadelphia	8,942	7,021	7,107	86	1.22%
Washington Dulles	6,201	6,155	6,803	648	10.53%
Baltimore	5,281	5,033	6,787	1,754	34.85%
Atlanta	5,194	6,016	5,742	-274	-4.55%
New York Newark	5,612	5,633	5,598	-35	-0.62%
Raleigh/Durham	4,106	4,115	5,054	939	22.82%
Nantucket	4,406	3,445	3,619	174	5.05%
Dallas/Fort Worth	4,362	3,545	3,445	-100	-2.82%
Charlotte	2,928	3,292	3,171	-121	-3.68%
Orlando	3,673	3,528	3,084	-444	-12.59%
Detroit	2,907	2,832	2,888	56	1.98%
Los Angeles	3,374	2,658	2,667	9	0.34%
Fort Lauderdale/Hollywood	2,691	3,075	2,619	-456	-14.83%
Martha's Vineyard	3,304	2,227	2,610	383	17.20%
Bangor	3,195	2,949	2,532	-417	-14.14%
Denver	2,304	1,992	2,445	453	22.74%
San Francisco	3,083	2,593	2,179	-414	-15.97%
Miami	2,183	2,075	2,101	26	1.25%
Buffalo	1,329	1,226	2,096	870	70.96%
Provincetown	2,169	1,657	2,062	405	24.44%
Pittsburgh	2,139	2,023	2,058	35	1.73%
Westchester County	1,908	2,258	2,053	-205	-9.08%
Cincinnati	2,724	2,640	2,014	-626	-23.71%
Indianapolis	1,142	2,079	1,862	-217	-10.44%
Houston Intercontinental	1,569	1,753	1,857	104	5.93%
Columbus	2,083	2,118	1,792	-326	-15.39%
Tampa	1,743	1,949	1,779	-170	-8.72%
Syracuse	1,337	1,762	1,762	0	0.00%
Las Vegas	1,474	1,679	1,762	83	4.94%
Minneapolis	2,009	1,792	1,697	-95	-5.30%
Milwaukee	1,839	2,184	1,670	-514	-23.53%
Fort Myers	1,064	1,531	1,618	87	5.68%
Rochester		1,183	1,562	379	32.04%
Richmond	1,678	1,409	1,557	148	10.50%
St. Louis	1,678	1,462	1,523	61	4.17%
West Palm Beach	1,348	1,131	1,492	361	31.92%
Rockland	1,360	1,375	1,357	-18	-1.31%
Phoenix	792	944	1,322	378	40.04%
Cleveland	1,263	1,262	1,314	52	4.12%
Islip	1,042	1,579	1,192	-387	-24.51%
Bar Harbor	1,374	1,153	1,179	26	2.25%

Table E-4 Logan Airport Scheduled Passenger Departures by Destination (continued)

Destination Airport	2004	2005	2006	2005-2006 Change	2005-2006 Percent Change
Chicago Midway	1,198	1,340	1,131	-209	-15.60%
Memphis	702	1,035	1,053	18	1.74%
Presque Isle	1,028	1,018	1,018	0	0.00%
Hyannis	1,852	1,057	996	-61	-5.77%
Newport News	428	670	948	278	41.49%
Saranac Lake	275	800	940	140	17.50%
Burlington	1,098	1,631	931	-700	-42.92%
Long Beach	692	853	840	-13	-1.52%
Oakland	487	852	813	-39	-4.58%
Allentown/Bethlehem		622	779	157	25.24%
Harrisburg	932	887	744	-143	-16.12%
Akron/Canton	428	731	726	-5	-0.68%
Jacksonville		426	722	296	69.48%
Salt Lake City	728	730	709	-21	-2.88%
Norfolk	1,347	1,035	704	-331	-31.98%
Albany	1,387	1,074	661	-413	-38.45%
Greensboro	1,177	1,122	657	-465	-41.44%
Rutland	627	644	626	-18	-2.80%
Augusta	392	622	600	-22	-3.54%
Kansas City		239	513	274	114.64%
Seattle/Tacoma	999	609	394	-215	-35.30%
San Diego	306	365	365	0	0.00%
San Jose	406	244	365	121	49.59%
Austin			352	352	
Nashville			318	318	
Charleston	13	61	287	226	370.49%
Savannah	43	78	278	200	256.41%
Myrtle Beach	135	265	265	0	0.00%
Dayton			98	98	
Trenton			61	61	
Sarasota		30	35	5	16.67%
Portland, ME	1,569	1,396		-1,396	-100.00%
Wilkes-Barre Scranton		417		-417	-100.00%
New Orleans	244	191		-191	-100.00%
Columbia	91			0	
Atlantic City	17			0	
Total Domestic	**164,208**	**163,844**	**166,256**	**2,142**	**1.47%**

Table E-4 Logan Airport Scheduled Passenger Departures by Destination (continued)

Destination Airport	2004	2005	2006	2005-2006 Change	2005-2006 Percent Change
International					
Toronto	3,693	3,880	4,054	174	4.48%
London Heathrow	2,174	2,136	2,153	17	0.80%
Montreal Dorval	1,891	2,575	1,836	-739	-28.70%
Halifax	2,271	1,892	1,605	-287	-15.17%
San Juan	1,515	1,240	1,292	52	4.19%
Ottawa	928	866	874	8	0.92%
Shannon	436	735	796	61	8.30%
Paris De Gaulle	868	853	787	-66	-7.74%
Frankfurt	563	574	544	-30	-5.23%
Bermuda	580	518	513	-5	-0.97%
Nassau	69	100	431	331	331.00%
Fredericton	732	687	365	-322	-46.87%
Amsterdam	366	365	365	0	0.00%
Reykjavik	353	361	361	0	0.00%
Zurich	357	357	361	4	1.12%
Milan Malpensa	362	344	335	-9	-2.62%
Aruba	274	339	289	-50	-14.75%
Manchester	184	239	244	5	2.09%
Munich	214	208	213	5	2.40%
Quebec		30	213	183	610.00%
Santo Domingo	192	174	160	-14	-8.05%
San Salvador	187	178	131	-47	-26.40%
Saint Thomas	104	108	117	9	8.33%
Ponta Delgada	61	39	109	70	179.49%
Rome Leonardo Da Vinci-Fiumicino	88	135	78	-57	-42.22%
Praia		9	78	69	766.67%
Cancun	305	209	70	-139	-66.51%
Mexico City	331	235	52	-183	-77.87%
Providenciales	43	44	48	4	9.09%
Grand Cayman		31	43	12	38.71%
Montego Bay	514	239	39	-200	-83.68%
Lisbon			26	26	
Stockholm-Arlanda			26	26	
Punta Cana			17	17	
Terceira			13	13	
Vancouver	92	61		-61	-100.00%
Ilha Do Sal	22	57		-57	-100.00%
Nykoping		30		-30	-100.00%
Dublin	113				
Port Au Prince	56				
Lerwick Sumburgh Apt	31				
Total International	**19,969**	**19,879**	**18,638**	**-1,241**	**-6.24%**
Total Scheduled Carrier Operations	**184,177**	**183,723**	**184,894**	**1,171**	**0.64%**

Note: Annualized airline schedules do not reflect service disruptions of schedule changes that occurred during September as a result of September 11, 2001.
Source: Official Airline Guide.

F

Regional Transportation Context

This appendix provides detailed tables in support of *Chapter 4, Regional Transportation Context*:

- Table F-1 Aircraft Operations by Classification for New England's Airports, 2000 to 2006
- Table F-2 Percentage Change in Aircraft Operations by Classification for New England's Airports, 2000 to 2006
- Scheduled Passenger Operations by Market and Carrier for New England's Regional Airports
    - Table F-3 Bradley International Airport, Connecticut
    - Table F-4 T.F. Green Airport, Rhode Island
    - Table F-5 Manchester-Boston Regional Airport, New Hampshire
    - Table F-6 Portland International Jetport, Maine
    - Table F-7 Burlington Airport, Vermont
    - Table F-8 Bangor Airport, Maine
    - Table F-9 Tweed-New Haven Airport, Connecticut
    - Table F-10 Worcester Regional Airport, Massachusetts
    - Table F-11 Hanscom Field, Massachusetts
    - Table F-12 Pease International Tradeport, New Hampshire

Table F-1 Aircraft Operations by Classification for New England's Airports, 2000 to 2006

Airport	Bradley International	T.F. Green	Manchester-Boston Regional	Portland International Jetport	Burlington	Bangor	Tweed-New Haven	Worcester Regional	Pease International Tradeport	Hanscom Field	Subtotal	Logan[2]	Total
2000													
Commercial	132,062	103,750	61,506	47,609	45,745	21,446	5,260	4,029	6,104	6,572	434,083	452,763	886,846
General Aviation[1]	31,863	52,184	45,740	56,571	59,377	34,831	56,200	46,518	31,601	204,512	619,397	35,233	654,630
Military & Other	5,811	2,764	586	2,072	10,241	26,507	328	495	9,973	1,287	60,064	0	60,064
Total	169,736	158,698	107,832	106,252	115,363	82,784	61,788	51,042	47,678	212,371	1,113,544	487,996	1,601,540
2001													
Commercial	128,638	100,606	61,669	47,770	47,261	18,286	4,581	5,631	4,485	6,414	425,341	434,386	859,727
General Aviation[1]	30,478	45,095	44,358	62,014	61,986	35,230	56,092	45,464	30,148	197,770	608,635	28,739	637,374
Military & Other	5,913	2,635	607	2,259	11,821	26,623	437	917	8,221	1,252	60,685	0	60,685
Total	165,029	148,336	106,634	112,043	121,068	80,139	61,110	52,012	42,854	205,436	1,094,661	463,125	1,557,786
2002													
Commercial	113,194	96,595	62,346	45,899	38,929	24,412	3,827	4,062	5,059	6,603	400,926	366,476	767,402
General Aviation[1]	27,838	45,473	29,549	57,720	59,679	35,711	62,163	52,277	28,333	210,221	608,964	25,596	634,560
Military & Other	6,085	2,587	376	2,162	12,167	27,297	593	418	8,220	1,424	61,329	0	61,329
Total	147,117	144,655	92,271	105,781	110,775	87,420	66,583	56,757	41,612	218,248	1,071,219	392,072	1,463,291
2003													
Commercial	103,917	84,301	68,184	42,658	38,293	25,626	3,705	868	4,552	2,956	375,060	344,644	719,704
General Aviation[1]	27,115	42,878	29,552	44,036	50,461	36,706	54,224	55,972	24,866	190,789	556,599	28,660	585,259
Military & Other	4,214	2,496	324	1,449	11,466	32,938	776	378	7720	1,142	62,903	0	62903
Total	135,246	129,675	98,060	88,143	100,220	95,270	58,705	57,218	37,138	194,887	994,562	373,304	1,367,866
2004													
Commercial	108,823	83,496	75,360	46,474	41,719	24,970	4,501	0	3,981	4,308	393,632	374,022	767,654
General Aviation[1]	32,269	34,878	27,438	41,547	54,709	29,884	58,881	61,343	25,962	175,301	542,212	31,236	573,448
Military & Other	4,100	346	749	1,338	12,404	29,676	1,010	530	7,797	1,195	59,145	0	59,145
Total	145,192	118,720	103,547	89,359	108,832	84,530	64,392	61,873	37,740	180,804	994,989	405,258	1,400,247
2005													
Commercial	119,048	88,374	76,115	42,661	43,987	25,976	6,137	2,727	3,197	3,627	411,849	377,830	789,679
General Aviation[1]	33,341	28,138	27,061	36,191	49,888	30,016	60,893	62,743	25,446	165,424	519,141	31,236	550,377
Military & Other	3,701	241	477	1,405	11,468	24,154	1,063	519	7,669	904	51,601	0	51,601
Total	156,090	116,753	103,653	80,257	105,343	80,146	68,093	65,989	36,312	169,955	982,591	409,066	1,391,657
2006													
Commercial	111,341	81,282	68,590	38,663	41,342	23,466	5,177	3,793	3,981	3,057	380,692	374,675	755,367
General Aviation[1]	34,548	25,510	25,507	35,572	44,471	29,848	51,702	56,770	25,962	167,560	497,450	31,444	528,894
Military & Other	4,348	229	708	1,536	9,299	22,359	1,157	609	7,797	1,433	49,475	0	49,475
Total	**150,237**	**107,021**	**94,805**	**75,771**	**95,112**	**75,673**	**58,036**	**61,172**	**37,740**	**168,993**	**924,560**	**406,119**	**1,330,679**

1 Includes itinerant and local general aviation operations at the regional airports. There are no local (touch-and-go training) operations at Logan Airport.
2 Includes international operations.
Note: 2001 General Aviation data for New Haven includes general aviation, military, and other operations.
Source: Massport, Federal Aviation Administration (FAA) Tower Counts, and individual airport records.

Table F-2 Percentage Change in Aircraft Operations by Classification for New England's Airports, 2000 to 2006

	Bradley International	T.F. Green	Manchester-Boston Regional	Portland International Jetport	Burlington	Bangor	Tweed-New Haven	Worcester Regional	Pease International Tradeport	Hanscom Field	Subtotal	Logan[2]	Total
2000-2001													
Commercial	(2.6)%	(3.0)%	0.3%	0.3%	3.3%	(14.7)%	(12.9)%	39.8%	(26.5)%	(2.4)%	(2.0)%	(4.1)%	(2.9)%
General Aviation[1]	(4.3)%	(13.6)%	(3.0)%	9.6%	4.4%	1.1%	(0.2)%	(2.3)%	(4.6)%	(3.3)%	(1.7)%	(18.4)%	(2.2)%
Military & Other	1.8%	(4.7)%	3.6%	9.0%	15.4%	0.4%	33.2%	85.3%	(17.6)%	(2.7)%	1.0%	-	4.9%
Total	(2.8)%	(6.5)%	(1.1)%	5.5%	4.9%	(3.2)%	(1.1)%	1.9%	(10.1)%	(3.3)%	(1.7)%	(5.1)%	(2.4)%
2001 Percent of Total	12.6%	11.3%	8.1%	8.6%	9.2%	6.1%	4.7%	4.0%	2.8%	13.2%	70.3%	29.7%	100.0%
2001 to 2002													
Commercial	(12.0)%	(4.0)%	1.1%	(3.9)%	(17.6)%	33.5%	(16.5)%	(27.9)%	12.8%	2.9%	(5.7)%	(15.6)%	(11.0)%
General Aviation[1]	(8.7)%	0.8%	(33.4)%	(6.9)%	(3.7)%	1.4%	10.8%	15.0%	(6.0)%	6.3%	0.1%	(10.9)%	(3.3)%
Military & Other	2.9%	(1.8)%	(38.1)%	(4.3)%	2.9%	2.5%	35.7%	(54.4)%	(0.0)%	13.7%	1.1%	-	0.9%
Total	(10.9)%	(2.5)%	(13.5)%	(5.6)%	(8.5)%	9.1%	9.0%	9.1%	(2.9)%	6.2%	(2.1)%	(15.3)%	(8.1)%
2002 Percent of Total	12.2%	12.0%	7.7%	8.8%	9.2%	7.3%	5.5%	4.7%	2.8%	14.9%	73.2%	26.8%	100.0%
2002 to 2003													
Commercial	(8.2)%	(12.7)%	9.4%	(7.1)%	(1.6)%	5.0%	(3.2)%	(78.6)%	(10.0)%	(55.2)%	(6.5)%	(6.0)%	(5.8)%
General Aviation[1]	(2.6)%	(5.7)%	0.0%	(23.7)%	(15.4)%	2.8%	(12.8)%	7.1%	(12.2)%	(9.2)%	(8.6)%	12.0%	(6.7)%
Military & Other	(30.7)%	(3.5)%	(13.8)%	(33.0)%	(5.8)%	20.7%	30.9%	(9.6)%	(6.1)%	(19.8)%	2.6%	-	4.6%
Total	(8.1)%	(10.4)%	6.3%	(16.7)%	(9.5)%	9.0%	(11.8)%	0.8%	(10.8)%	(10.7)%	(7.2)%	(4.8)%	(5.6)%
2003 Percent of Total	11.9%	11.4%	8.6%	7.8%	8.8%	8.4%	5.2%	5.0%	2.7%	14.2%	72.7%	27.3%	100.0%
2003 to 2004													
Commercial	4.7%	(1.0)%	10.5%	8.9%	8.9%	(2.6)%	21.5%	(100.0)%	(12.5)%	45.7%	5.0%	8.5%	6.6%
General Aviation[1]	19.0%	(18.7)%	(7.2)%	(5.7)%	8.4%	(18.6)%	8.6%	9.6%	4.4%	(8.1)%	(2.6)%	9.0%	0.7%
Military & Other	(2.7)%	(86.1)%	131.2%	(7.7)%	8.2%	(9.9)%	30.2%	40.2%	1.0%	4.6%	(6.0)%	-	(7.2)%
Total	7.4%	(8.4)%	5.6%	1.4%	8.6%	(11.3)%	9.7%	8.1%	1.6%	(7.2)%	0.0%	8.6%	4.0%
2004 Percent of Total	12.3%	10.0%	8.8%	7.6%	9.2%	7.2%	5.4%	5.2%	2.7%	12.9%	71.1%	28.9%	100.0%
2004 to 2005													
Commercial	9.4%	5.8%	1.0%	(8.2)%	5.4%	4.0%	36.3%	-	(19.7)%	(15.8)%	4.6%	1.0%	2.9%
General Aviation[1]	3.3%	(19.3)%	(1.4)%	(12.9)%	(8.8)%	0.4%	3.4%	2.3%	(2.0)%	(5.6)%	(4.3)%	0.0%	(4.0)%
Military & Other	(9.7)%	(30.3)%	(36.3)%	5.0%	(7.5)%	(18.6)%	5.2%	(2.1)%	(1.6)%	(24.4)%	(12.8)%	-	(12.8)%
Total	7.5%	(1.7)%	0.1%	(10.2)%	(3.2)%	(5.2)%	5.7%	6.7%	(3.8)%	(6.0)%	(1.2)%	0.9%	(0.6)%
2005 Percent of Total	11.2%	8.4%	7.4%	5.8%	7.6%	5.8%	4.9%	4.7%	2.6%	12.2%	70.6%	29.4%	100.0%
2005-2006													
Commercial	(6.5)%	(8.0)%	(9.9)%	(9.4)%	(6.0)%	(9.7)%	(15.6)%	39.1%	24.5%	(15.7)%	(7.6)%	(0.8)%	(4.3)%
General Aviation[1]	3.6%	(9.3)%	(5.7)%	(1.7)%	(10.9)%	(0.6)%	(15.1)%	(9.5)%	2.0%	1.3%	(4.2)%	0.7%	(3.9)%
Military & Other	17.5%	(5.0)%	48.4%	9.3%	(18.9)%	(7.4)%	8.8%	17.3%	1.7%	58.5%	(4.1)%	-	(4.1)%
Total	**(3.7)%**	**(8.3)%**	**(8.5)%**	**(5.6)%**	**(9.7)%**	**(5.6)%**	**(14.8)%**	**(7.3)%**	**3.9%**	**(0.6)%**	**(5.9)%**	**(0.7)%**	**(4.4)%**
2006 Percent of Total	**11.3%**	**8.0%**	**7.1%**	**5.7%**	**7.1%**	**5.7%**	**4.4%**	**4.6%**	**2.8%**	**12.7%**	**69.5%**	**30.5%**	**100.0%**

1 Includes itinerant and local general aviation operations at the regional airports. There are no local (touch-and-go training) operations at Logan Airport.
2 Includes international operations.
Note: 2001 to 2002 General Aviation data for New Haven includes general aviation, military and other operations
Source: Massport, FAA Tower Counts, and individual airport records.

Table F-3 Scheduled Passenger Operations by Market and Carrier for Bradley International Airport

		Flights					Seats				
Carrier	Market	2004	2005	2006	Change	Percent Change	2004	2005	2006	Change	Percent Change
Jet Carriers											
America West	Phoenix	366	366	364	-2	-0.5%	51,960	54,627	54,558	-69	(0.13%)
American	Chicago O'Hare	2,001	1,574	957	-617	-39.2%	265,113	204,054	123,444	-80,610	(39.50%)
American	Dallas/Fort Worth	1,403	1,055	1,078	23	2.2%	180,987	137,038	143,630	6,592	4.81%
American	Miami	487	366	365	-1	-0.3%	71,102	50,059	52,558	2,499	4.99%
American	San Juan	366	366	364	-2	-0.5%	92,171	54,594	81,473	26,879	49.23%
Continental	Cleveland	127	131	91	-40	-30.5%	15,985	16,182	9,803	-6,379	(39.42%)
Continental	Houston Intercontinental	222	314	225	-89	-28.3%	25,341	34,139	26,361	-7,778	(22.78%)
Delta	Atlanta	2,558	3,133	2,399	-734	-23.4%	450,671	480,501	346,019	-134,482	(27.99%)
Delta	Cincinnati	1,438	1,378	766	-612	-44.4%	257,177	197,099	102,413	-94,686	(48.04%)
Delta	Salt Lake City		26	207	181	696.2%		3,915	31,176	27,261	696.32%
Delta	Las Vegas			108	108	-			16,238	16,238	-
Delta	Los Angeles			208	208	-			31,890	31,890	-
Delta	Fort Lauderdale/Hollywood			472	472	-			78,602	78,602	-
Delta	Orlando			524	524	-			87,704	87,704	-
Delta	West Palm Beach			242	242	-			38,130	38,130	-
Delta	Fort Myers			30	30	-			4,304	4,304	-
Delta	Tampa			450	450	-			72,060	72,060	-
Laker Airways (Bahamas) Limited	Freeport	26			0	-	3,900			0	-
Northwest	Detroit	1,504	1,456	1,394	-62	-4.3%	204,604	192,970	180,912	-12,058	(6.25%)
Northwest	Minneapolis	1,098	1,046	1,057	11	1.1%	149,646	140,375	146,804	6,429	4.58%
Song	Fort Lauderdale/Hollywood	702	676	242	-434	-64.2%	139,613	134,176	48,254	-85,922	(64.04%)
Song	Los Angeles		100	82	-18	-18.0%		19,910	16,372	-3,538	(17.77%)
Song	Orlando	1,023	1,099	364	-735	-66.9%	203,634	218,144	72,380	-145,764	(66.82%)
Song	Tampa	662	680	229	-451	-66.3%	131,795	135,041	45,669	-89,372	(66.18%)
Song	West Palm Beach	537	519	121	-398	-76.7%	106,806	103,012	24,127	-78,885	(76.58%)
Southwest Airlines	Baltimore	3,059	3,104	3,104	0	0.0%	419,083	424,316	424,877	561	0.13%
Southwest Airlines	Chicago Midway	710	954	1,031	77	8.1%	97,309	130,513	141,184	10,671	8.18%
Southwest Airlines	Las Vegas	375	366	364	-2	-0.5%	51,336	50,060	49,830	-230	(0.46%)
Southwest Airlines	Nashville	366	366	364	-2	-0.5%	50,142	50,060	49,830	-230	(0.46%)
Southwest Airlines	Orlando	833	1,112	1,104	-8	-0.7%	114,082	151,967	151,269	-698	(0.46%)
Southwest Airlines	Philadelphia	296	1,595	1,074	-521	-32.7%	40,591	218,118	147,116	-71,002	(32.55%)
Southwest Airlines	Tampa	383	698	727	29	4.2%	52,530	95,352	99,659	4,307	4.52%
United Airlines	Chicago O'Hare	2,065	1,818	1,810	-8	-0.4%	317,682	259,712	253,288	-6,424	(2.47%)
United Airlines	Washington Dulles	492	728	940	212	29.1%	63,854	81,728	111,047	29,319	35.87%

Table F-3 Scheduled Passenger Operations by Market and Carrier for Bradley International Airport (continued)

		Flights					Seats				
Carrier	**Market**	**2004**	**2005**	**2006**	**Change**	**Percent Change**	**2004**	**2005**	**2006**	**Change**	**Percent Change**
Jet Carriers (cont'd)											
US Airways	Charlotte	1,574	2,197	1,654	-543	-24.7%	229,826	351,454	227,078	-124,376	(35.39%)
US Airways	Fort Lauderdale/Hollywood	9	126		-126	-	1,272	15,503		-15,503	-
US Airways	Orlando	48	31	30	-1	-3.2%	5,986	3,863	3,741	-122	(3.16%)
US Airways	Philadelphia	1,913	2,110	927	-1,183	-56.1%	267,741	301,864	139,404	-162,460	(53.82%)
US Airways	Pittsburgh	1,198	26		-26	-	157,633	3,132		-3,132	-
US Airways	Washington National	1,081	1,068	944	-124	-11.6%	141,901	141,279	129,831	-11,448	(8.10%)
USA 3000 Airlines	Cancun		26	30	4	15.4%		4,307	5,092	785	18.23%
USA 3000 Airlines	Punta Cana		13	22	9	69.2%		2,114	3,637	1,523	72.04%
Subtotal		30,925	32,628	28,470	-4,159	-12.7%	4,363,475	4,463,183	3,773,770	-689,414	(15.45%)
Regional/Commuter Carriers											
Air Canada Jazz	Montreal Dorval	152			0	-	5,624			0	-
Air Canada Jazz	Toronto	610	719	966	247	34.4%	22,570	26,557	36,121	9,564	36.01%
Air Georgian (AC)	Montreal Dorval	885	1,042	1,018	-24	-2.3%	15,933	19,496	19,333	-163	(0.84%)
Air Georgian (AC)	Toronto	728	628	312	-316	-50.3%	13,096	11,732	5,923	-5,809	(49.51%)
American Connection/Transtates	St. Louis	880	950	892	-58	-6.1%	32,571	44,361	44,599	238	0.54%
American Eagle	Chicago O'Hare	9		697	697	-	416		33,921	33,921	-
American Eagle	Raleigh/Durham	1,233	1,369	1,364	-5	-0.4%	46,535	54,597	52,133	-2,464	(4.51%)
Continental Express	Cleveland	1,124	1,107	1,156	49	4.4%	56,179	55,075	57,806	2,731	4.96%
Continental Express	New York Newark	1,368	1,356	1,360	4	0.3%	68,285	67,529	67,981	452	0.67%
Delta Connection/Chautauqua	Columbus	93	998	541	-457	-45.8%	4,650	49,299	23,685	-25,614	(51.96%)
Delta Connection/Chautauqua	Cincinnati			100	100	-			4,980	4,980	-
Delta Connection/Chautauqua	New York JFK			113	113	-			4,165	4,165	-
Delta Connection/ASA	Atlanta			82	82	-			5,789	5,789	-
Delta Connection/Freedom	New York JFK			429	429	-			15,861	15,861	-
Delta Connection/Comair	Columbus			78	78	-			3,897	3,897	-
Delta Connection/Comair	Orlando			87	87	-			6,062	6,062	-
Delta Connection/Comair				359	359	-			25,157	25,157	-
Midwest Connect	Milwaukee	941		940	940	-	30,117		30,068	30,068	-
Northwest Airlink/Pinnacle	Indianaplolis	113	640	624	-16	-2.5%	5,664	31,973	31,176	-797	(2.49%)
Northwest Airlink/Pinnacle	Minneapolis		31		-31	-		1,522		-1,522	-
Northwest Airlink/Pinnacle	Detroit			95	95	-			4,763	4,763	-
United Express	Chicago O'Hare	475	693	688	-5	-0.7%	24,456	48,416	48,106	-310	(0.64%)
United Express	Washington Dulles	1,676	1,526	1,013	-513	-33.6%	84,513	84,651	63,218	-21,433	(25.32%)
US Airways Express	Buffalo	889	841	827	-14	-1.7%	32,121	28,627	28,119	-508	(1.77%)
US Airways Express	Charlotte			104	104	-			6,686	6,686	-
US Airways Express	Philadelphia	206	440	1,936	1,496	339.9%	9,500	27,675	119,257	91,582	330.92%
US Airways Express	Pittsburgh	183	1,652	1,628	-24	-1.4%	9,247	84,729	88,358	3,629	4.28%
US Airways Express	Rochester	575	576	567	-9	-1.5%	21,280	19,570	19,286	-284	(1.45%)
US Airways Express	Syracuse	584	480		-480	-	11,093	9,091		-9,091	-
US Airways Express	Washington National	392	554	896	342	61.7%	19,813	34,513	58,884	24,371	70.62%
Subtotal		13,116	15,602	18,872	3,270	21.0%	513,662	699,413	905,333	205,920	29.44%
Total		**44,041**	**48,230**	**47,342**	**-888**	**-1.8%**	**4,877,138**	**5,162,596**	**4,679,103**	**-483,493**	**(9.37%)**

Source: OAG Schedule Tapes.

Table F-4 Scheduled Passenger Operations by Market and Carrier for T.F. Green Airport

		Departures					Seats				
Carrier	Market	2003	2005	2006	Change	Percent Change	2003	2005	2006	Change	Percent Change
Jet Carriers											
American Airlines	Dallas/Fort Worth	366	366	91	-275	(75.16%)	47,214	47,137	11,730	-35,407	(75.12%)
American Airlines	Chicago O'Hare	1,609	1,116	260	-856	(76.72%)	207,543	143,654	33,514	-110,140	(76.67%)
Continental	Cleveland	131	13		-13	-	15,622	1,618		-1,618	-
Continental	New York Newark	331	283		-283	-	38,535	34,878		-34,878	-
Delta Air Lines	Atlanta	1,830	1,984	827	-1,157	(58.32%)	289,611	291,407	108,527	-182,880	(62.76%)
Delta Air Lines	Cincinnati	732	698	238	-460	(65.90%)	103,944	89,332	23,815	-65,517	(73.34%)
L.B. Limited	Freeport	9			0	-	1,329			0	-
Northwest	Detroit	1,512	1,557	1,390	-167	(10.73%)	203,837	202,545	191,057	-11,488	(5.67%)
Northwest	Minneapolis	641	541	303	-238	(43.97%)	85,995	68,974	41,949	-27,025	(39.18%)
SATA	Ponta Delgada	17		17	17	-	3,486		3,464	3,464	-
Southwest Airlines	Baltimore	4,222	4,194	4,235	41	0.98%	578,063	573,304	580,159	6,855	1.20%
Southwest Airlines	Chicago Midway	1,089	1,352	1,368	16	1.18%	149,232	184,745	187,454	2,709	1.47%
Southwest Airlines	Fort Lauderdale/Hollywoc	26			0	-	3,562			0	-
Southwest Airlines	Las Vegas	9	31	364	333	1074.19%	1,194	4,172	49,830	45,658	1094.39%
Southwest Airlines	Philadelphia	1,199	1,779	1,910	131	7.36%	164,224	238,645	261,216	22,571	9.46%
Southwest Airlines	Kansas City	366	366	30	-336	(91.80%)	50,142	50,060	4,152	-45,908	(91.71%)
Southwest Airlines	Nashville	706	724	394	-330	(45.58%)	96,722	98,928	53,982	-44,946	(45.43%)
Southwest Airlines	Orlando	1,586	1,827	1,832	5	0.27%	217,302	249,703	250,928	1,225	0.49%
Southwest Airlines	Phoenix	732	728	727	-1	(0.14%)	100,284	99,523	99,659	136	0.14%
Southwest Airlines	Tampa	1,085	1,090	1,087	-3	(0.28%)	148,625	148,987	148,896	-91	(0.06%)
Spirit Airlines	Detroit	61	122		-122	-	9,150	18,270		-18,270	-
Spirit Airlines	Fort Lauderdale/Hollywoc	131	571	398	-173	(30.30%)	19,586	84,381	57,208	-27,173	(32.20%)
Spirit Airlines	Fort Myers	70	366	182	-184	(50.27%)	10,436	54,810	29,825	-24,985	(45.58%)
United Airlines	Chicago O'Hare	1,555	1,465	1,485	20	1.37%	234,843	200,813	188,468	-12,345	(6.15%)
US Airways	Charlotte	1,582	1,866	1,429	-437	(23.42%)	223,314	274,911	223,415	-51,496	(18.73%)
US Airways	Fort Lauderdale/Hollywoc	1,598	17		-17	-	79,879	2,218		-2,218	-
US Airways	Orlando	180	44	13	-31	(70.45%)	8,986	148,874		-148,874	-
US Airways	Philadelphia	2,416	2,193	1,126	-1,067	(48.65%)	345,461	313,648	148,874	-164,774	(52.53%)
US Airways	Pittsburgh	1,290	31		-31	-	174,598	4,367		-4,367	-
US Airways	Washington National	1,107	1,273	1,329	56	4.40%	149,503	170,102	176,014	5,912	3.48%
Subtotal		28,187	26,597	21,035	-5,562	(20.91%)	3,762,220	3,800,006	2,874,136	-925,870	(24.36%)

Table F-4 Scheduled Passenger Operations by Market and Carrier for T.F. Green Airport (continued)

		Departures					Seats				
Carrier	Market	2003	2005	2006	Change	Percent Change	2003	2005	2006	Change	Percent Change
Regional/Commuter Carriers											
Air Georgian (AC)	Toronto	798	737	697	-40	(5.41%)	14,364	13,794	13,245	-549	(3.98%)
American Eagle	Raleigh/Durham	643	349		-349	-	25,643	13,276		-13,276	-
American Eagle	Chicago O'Hare			836	836	-			36,822	36,822	-
Cape Air	Hyannis			1,273	1,273	-			11,457	11,457	-
Cape Air	Martha's Vineyard	1,960	1,012	26	-986	(97.43%)	17,640	9,083	234	-8,849	(97.43%)
Cape Air	Nantucket	2,765	1,195	1,035	-160	(13.40%)	24,885	10,727	9,314	-1,413	(13.17%)
Continental Express	Cleveland	1,119	1,243	4	-1,239	(99.65%)	55,900	61,988	450	-61,538	(99.27%)
Continental Express	New York Newark	1,395	1,461	281	-1,180	(80.74%)	67,702	71,279	29,271	-42,008	(58.93%)
Delta Connection/ASA	Atlanta		31	701	670	2161.29%		1,522	37,065	35,543	2335.28%
Delta Connection/ASA	Cincinnati		31	61	30	96.77%		1,522	3,031	1,509	99.15%
Delta Connection/Chautauqua	Cincinnati	214		13	13	-	10,700		537	537	-
Delta Connection/Comair	Cincinnati	121	344	671	327	95.10%	6,050	17,618	39,663	22,045	125.13%
Delta Connection/Chautauqua	New York JFK			225	225	-			8,331	8,331	-
Delta Connection/Freedom	New York JFK			312	312	-			11,535	11,535	-
Northwest Airlink/Pinnacle	Minneapolis	79	31		-31	-	3,943	1,522		-1,522	-
United Express	Washington Dulles	1,876	1,722	1,650	-72	(4.20%)	93,779	85,912	84,825	-1,087	(1.27%)
United Express	Chicago O'Hare	214	261	334	73	27.97%	10,700	18,270	23,339	5,069	27.74%
US Airways Express	Charlotte	13	17	338	321	1886.71%	657	870	26,569	25,699	2953.89%
US Airways Express	Washington National	143	484	624	140	28.83%	7,171	31,129	31,271	142	0.46%
US Airways Express	Pittsburgh	183	1,365	1,390	25	1.83%	9,157	72,862	76,641	3,779	5.19%
US Airways Express	New York La Guardia	1,808	1,674	1,810	136	8.12%	50,163	55,132	59,460	4,328	7.85%
US Airways Express	Philadelphia	22	715	1,680	965	134.97%	1,324	45,048	105,137	60,089	133.39%
Subtotal		13,353	12,672	13,961	1,289	10.17%	399,779	511,554	608,197	96,643	18.89%
Total		**41,540**	**39,269**	**34,995**	**-4,274**	**(10.88%)**	**4,161,999**	**4,311,560**	**3,482,333**	**-829,227**	**(19.23%)**

Source: OAG Schedule Tapes.

Table F-5 Scheduled Aircraft Operations by Market and Carrier for Manchester-Boston Regional Airport

		Departures					Seats				
Carrier	Market	2004	2005	2006	Change	Percent Change	2004	2005	2006	Change	Percent Change
Jet Carriers											
Continental	New York Newark	314	288	260	-28	(9.72%)	36,123	31,076	27,019	-4,057	(13.06%)
Delta Air Lines	Atlanta	732	671		-671	-	103,944	95,126		-95,126	-
Delta Air Lines	Cincinnati	710	667		-667	-	100,840	86,834		-86,834	-
Northwest	Detroit	1,460	1,404	1,295	-109	(7.79%)	202,623	181,073	180,284	-789	(0.44%)
Northwest	Minneapolis	362	366	238	-128	(34.93%)	44,835	46,980	30,258	-16,722	(35.59%)
Pan American Airways	Myrtle Beach	83			0	-	12,429			0	-
Pan American Airways	Portsmouth	183			0	-	27,471			0	-
Pan American Airways	Sanford	87			0	-	13,114			0	-
Southwest Airlines	Baltimore	3,874	3,863	3,845	-18	(0.47%)	530,588	527,946	523,458	-4,488	(0.85%)
Southwest Airlines	Chicago Midway	693	1,360		-1,360	-	94,744	185,741		-185,741	-
Southwest Airlines	Fort Lauderdale/Hollywood	9			0	-	1,194			0	-
Southwest Airlines	Kansas City	305			0	-	41,785			0	-
Southwest Airlines	Las Vegas	375	366	364	-2	(0.55%)	51,336	50,060	49,830	-230	(0.46%)
Southwest Airlines	Nashville	715	732	61	-671	(91.67%)	97,896	99,989	8,305	-91,684	(91.69%)
Southwest Airlines	Orlando	1,129	1,474	1,451	-23	(1.56%)	154,673	201,431	198,725	-2,706	(1.34%)
Southwest Airlines	Philadelphia	788	1,792	1,749	-43	(2.40%)	107,995	244,609	239,657	-4,952	(2.02%)
Southwest Airlines	Tampa	845	1,103	1,091	-12	(1.09%)	115,693	150,319	149,489	-830	(0.55%)
United Airlines	Chicago O'Hare	1,464	1,343	1,091	-252	(18.75%)	209,179	179,246	137,460	-41,786	(23.31%)
US Airways	Charlotte	1,276	1,312	658	-654	(49.84%)	167,699	179,003	90,887	-88,116	(49.23%)
US Airways	Philadelphia	1,806	2,032	680	-1,352	(66.54%)	244,129	275,085	94,901	-180,184	(65.50%)
US Airways	Pittsburgh	553			0	-	77,259			0	-
US Airways	Washington National	113	576	537	-39	(6.78%)	14,323	77,334	77,316	-18	(0.02%)
Subtotal		17,876	19,349	13,320	-6,029	(31.16%)	2,449,873	2,611,852	1,807,589	-804,263	(30.79%)

Table F-5 Scheduled Aircraft Operations by Market and Carrier for Manchester-Boston Regional Airport (continued)

		Departures					Seats				
Carrier	Market	2004	2005	2006	Change	Percent Change	2004	2005	2006	Change	Percent Change
Regional/Commuter Carriers											
Air Canada Jazz	Toronto	17			0	-	634			0	-
Air Georgian (AC)	Toronto	1,007	933	905	-28	(3.00%)	18,123	17,461	17,194	-267	(1.53%)
Continental Connection/CommutAir	Albany	1,007	314		-314	-	19,130	5,951		-5,951	-
Continental Express	Cleveland	1,198	1,190	1,208	18	1.51%	59,729	59,095	60,009	914	1.55%
Continental Express	New York Newark	1,150	1,168	1,191	23	1.97%	57,169	58,177	59,538	1,361	2.34%
Delta Connection/ASA	Atlanta	122	484	1,433	949	196.07%	6,100	26,492	94,091	67,599	255.17%
Delta Connection/ASA	Cincinnati		275		-275	-		13,702		-13,702	-
Delta Connection/Comair	Atlanta	244		182	182	-	12,200		12,730	12,730	-
Delta Connection/Comair	Cincinnati	750	462	983	521	112.77%	39,299	24,708	54,515	29,807	120.64%
Delta Connection/Comair	New York La Guardia	1,067	488		-488	-	53,350	24,360		-24,360	-
Delta Connection/Freedom	New York JFK			450	450	-			16,662		-
Northwest Airlink/Pinnacle	Detroit	13		91	91	-	664		4,547	4,547	-
Northwest Airlink/Pinnacle	Minneapolis	324	235	91	-144	(61.28%)	16,179	11,745	4,547	-7,198	(61.29%)
Pan Am Clipper Connection	Bangor	4			0	-	80			0	-
Pan Am Clipper Connection	New London/Groton	22			0	-	399			0	-
Pan Am Clipper Connection	Portsmouth	4			0	-	80			0	-
United Express/Air Wisconsin	Chicago O'Hare	183			0	-	9,150			0	-
United Express/Air Wisconsin	Washington Dulles	672			0	-	33,600			0	-
United Express/Atlantic Coast	Chicago O'Hare	30			0	-	1,500			0	-
United Express/Atlantic Coast	Washington Dulles	486			0	-	24,300			0	-
United Express/Chautauqua	Washington Dulles	244	610	30	-580	(95.08%)	12,200	30,450	1,516	-28,934	(95.02%)
United Express/GoJet	Chicago O'Hare		31	242	211	680.65%		2,132	16,974	14,842	696.15%
United Express/Mesa	Washington Dulles		244	1,225	981	402.05%		14,616	61,356	46,740	319.79%
United Express/Mesa	Chicago O'Hare			91		-			6,365		-
United Express/Transtates	Washington Dulles	276	911	56	-855	(93.85%)	13,800	45,457	2,815	-42,642	(93.81%)
US Airways Express	New York La Guardia	2,632	2,507	2,446	-61	(2.42%)	90,511	86,552	83,790	-2,762	(3.19%)
US Airways Express	Philadelphia	370	562	2,113	1,551	275.99%	19,654	30,202	115,559	85,357	282.62%
US Airways Express	Pittsburgh	567	1,024		-1,024	-	28,935	51,113		-51,113	-
US Airways Express	Washington National	976	510	546	36	6.98%	48,684	25,448	35,186	9,738	38.26%
Subtotal		13,365	11,948	13,283	1,335	11.17%	565,468	527,661	647,393	119,732	22.69%
Total		**31,241**	**31,297**	**26,603**	**-4,694**	**(15.00%)**	**3,015,341**	**3,139,513**	**2,454,982**	**-684,531**	**(21.80%)**

Source: OAG Schedule Tapes.

Table F-6 Scheduled Aircraft Operations by Market and Carrier for Portland International Jetport

		Departures					Seats				
Carrier	Market	2004	2005	2006	Change	Percent Change	2004	2005	2006	Change	Percent Change
Jet Carriers											
Delta Air Lines	Atlanta	732	488		-488		103,944	61,387		-61,387	
Delta Air Lines	Cincinnati	732	488	91	-397	(81.35%)	103,944	69,182	9,093	-60,089	(86.86%)
JetBlue Airways	New York JFK			849	0				118,815	118,815	
Northwest	Detroit	368	427	610	183	42.86%	36,800	42,630	61,053	18,423	43.22%
US Airways	Washington National	62	52		-52		7,936	6,656		-6,656	
US Airways	Philadelphia	294	152		-152		37,687	19,183		-19,183	
Subtotal		2,188	1,607	1,550	-57	(3.55%)	290,311	199,038	188,961	-10,077	(5.06%)
Regional/Commuter Carriers											
Continental Connection/CommutAir	Albany	1,268	296		-296		24,097	5,620		-5,620	
Continental Connection/CommutAir	Boston		74		-74			1,405		-1,405	
Continental Express	Cleveland	135	222	208	-14	(6.31%)	6,757	10,979	10,392	-587	(5.35%)
Continental Express	New York Newark	1,425	1,400	1,416	16	1.14%	70,061	69,704	70,796	1,092	1.57%
Delta Connection/Atlantic Coast Jet	Atlanta		702	1,364	662	94.29%		48,416	95,477	47,061	97.20%
Delta Connection/Atlantic Coast Jet	Boston	182			0		5,824			0	
Delta Connection/Atlantic Coast Jet	Cincinnati		31	940	909	2931.00%		1,522	49,752	48,230	3168.84%
Delta Connection/Comair	Boston	1,282	1,160		-1,160		64,100	57,855		-57,855	
Delta Connection/Comair	Cincinnati	184	571		-571		9,200	29,624		-29,624	
Delta Connection/Comair	New York La Guardia	1,098	1,099	996	-103	(9.38%)	54,900	54,810	49,795	-5,015	(9.15%)
Delta Connection/Freedom	New York JFK			443	443				16,021	16,021	
Northwest Airlink/Mesaba	Detroit	336	388	30	-358	(92.27%)	23,184	26,713	2,091	-24,622	(92.17%)
Northwest Airlink/Pinnacle	Detroit	691	532	294	-238	(44.74%)	34,564	26,535	14,722	-11,813	(44.52%)
Northwest Airlink/Pinnacle	Minneapolis	441	405	91	-314	(77.55%)	22,057	20,227	4,547	-15,681	(77.52%)
United Express	Chicago O'Hare	1,464	1,099	1,247	148	13.47%	73,200	67,599	87,293	19,694	29.13%
United Express	Washington Dulles	1,342	1,461	1,403	-58	(3.98%)	67,100	83,738	92,575	8,837	10.55%
US Airways Express	Charlotte	193	366	429	63	17.12%	9,643	23,751	30,821	7,070	29.77%
US Airways Express	New York La Guardia	1,364	1,670	1,836	166	9.94%	45,007	77,987	89,432	11,445	14.68%
US Airways Express	Philadelphia	1,222	1,923	2,139	216	11.23%	68,684	100,607	112,571	11,964	11.89%
US Airways Express	Pittsburgh	799	218		-218		43,103	10,874		-10,874	
US Airways Express	Presque Isle	130			0		2,470			0	
US Airways Express	Washington National	984	1,151	1,169	18	1.57%	49,207	75,603	77,316	1,713	2.27%
Subtotal		14,540	14,768	14,004	-764	(5.17%)	673,159	793,569	803,600	10,031	1.26%
Total		**16,729**	**16,375**	**15,554**	**-821**	**(5.01%)**	**963,470**	**992,607**	**992,561**	**-46**	**(0.00%)**

Source: OAG Schedule Tapes.

Table F-7 Scheduled Passenger Operations by Market and Carrier for Burlington Airport

		Departures					Seats				
Carrier	Market	2004	2005	2006	Change	Percent Change	2004	2005	2006	Change	Percent Change
Jet Carriers											
JetBlue	New York J F Kennedy	1,094	1,129	1,455	326	28.88%	171,129	174,052	220,899	46,847	26.92%
United	Chicago O'Hare	401	366	424	58	15.85%	51,286	42,404	54,558	12,154	28.66%
Continental	New York Newark	4			0		531			0	
Northwest	Detroit	214	174		-174		21,400	17,400		-17,400	
US Airways	Philadelphia	366	366	364	-2	(0.55%)	46,848	46,223	43,932	-2,291	(4.96%)
US Airways	Washington National		4		-4			548		-548	
Subtotal		2,079	2,039	2,243	204	10.00%	291,194	280,627	319,389	38,762	13.81%
Regional/Commuter Carriers											
American Eagle	Chicago O'Hare										
Continental Express	Cleveland	493	510	537	27	5.29%	24,145	25,334	26,846	1,512	5.97%
Continental Express	New York Newark	1,407	1,461	1,442	-19	(1.30%)	70,028	72,806	72,095	-711	(0.98%)
Continental Express	Westchester County	17			0		331			0	
Continental Express/CommutAir	Albany	541			0		10,284			0	
Continental Express/CommutAir	Boston		632	979	347			11,984	18,593	6,609	55.15%
Continental Express/CommutAir	Plattsburgh	423	366	580	214	58.47%	8,037	6,942	11,024	4,082	58.80%
Delta Connection	Atlanta		61	697	636			3,044	34,857	31,813	1045.09%
Delta Connection	Boston	1,098			0		45,072			0	
Delta Connection/Comair	Boston		1,007		-1,007			50,242		-50,242	
Delta Connection/Comair	Cincinnati	1,098	1,064	650	-414	(38.91%)	54,900	53,070	31,479	-21,591	(40.68%)
Delta Connection/Freedom	New York JFK			377	377				13,938	13,938	
Delta Connection/Comair	New York JFK			199	199				9,959	9,959	
Northwest Airlink/Mesaba	Detroit	184	214	481	267	124.77%	12,696	14,707	33,163	18,456	125.49%
Northwest Airlink/Pinnacle	Detroit	989	950	602	-348	(36.63%)	49,429	47,415	30,094	-17,321	(36.53%)
Northwest Airlink/Pinnacle	Minneapolis	13	61	61	0	0.00%	657	3,044	3,031	-13	(0.43%)
United Express	Chicago O'Hare	966	1,007	961	-46	(4.57%)	48,314	59,987	67,288	7,301	12.17%
United Express	Washington Dulles	1,464	1,461	1,451	-10	(0.68%)	73,200	72,862	72,528	-334	(0.46%)
US Airways Express	Charlotte			4	4				217	217	
US Airways Express	New York La Guardia	2,200	2,184	2,373	189	8.65%	81,400	80,636	87,795	7,159	8.88%
US Airways Express	Philadelphia	1,224	1,988	1,680	-308	(15.49%)	60,830	97,453	87,808	-9,645	(9.90%)
US Airways Express	Pittsburgh	675			0		33,771			0	
US Airways Express	Washington National	1,024	994	996	2	0.19%	51,200	61,457	57,970	-3,487	(5.67%)
Subtotal		13,818	13,960	14,070	110	0.79%	624,294	660,983	658,685	-2,298	(0.35%)
Total		**15,897**	**15,999**	**16,313**	**314**	**1.96%**	**915,488**	**941,610**	**978,074**	**36,464**	**3.87%**

Source: OAG Schedule Tapes.

Table F-8 Scheduled Passenger Operations by Market and Carrier for Bangor Airport

		Departures					Seats				
Carrier	Market	2004	2005	2006	Change	Percent Change	2004	2005	2006	Change	Percent Change
Regional/Commuter Carriers											
American Eagle	Boston	1,722	1,535	1,485	-50	-3.3%	64,063	56,654	55,983	-671	-1.2%
American Eagle	New York La Guardia	428	519	407	-112	-21.6%	15,836	19,153	15,060	-4,093	-21.4%
Continental Connection/CommutAir	Albany	575	192		-192		10,928	3,637		-3,637	
Continental Connection/CommutAir	Newark		480	559	79			22,568	23,707	1,139	
Delta Connection/ASA	Atlanta			212	212				14,852	14,852	
Delta Connection/Atlantic Coast Jet	Boston	737			0		23,575			0	
Delta Connection/Comair	Boston	736	1,421	1,035	-386	-27.2%	36,800	70,905	51,180	-19,725	-27.8%
Delta Connection/Comair	Cincinnati	1,464	1,400	675	-725	-51.8%	87,840	82,607	35,160	-47,447	-57.4%
Northwest Airlink	Detroit	968	1,016	818	-198	-19.5%	54,207	55,306	42,646	-12,660	-22.9%
Northwest Airlink	Minneapolis	13	61	13	-48	-78.7%	657	3,045	650	-2,395	-78.7%
Pan Am/Boston and Maine	Halifax	4			0		80			0	
Pan Am/Boston and Maine	Manchester	22			0		399			0	
US Airways Express	New York La Guardia	92	160		-160		4,600	7,830		-7,830	
US Airways Express	Philadelphia	1,072	1,182	1,121	-61	-5.2%	53,593	58,943	56,076	-2,867	-4.9%
Subtotal		7,833	7,966	6,325	-1,641	-20.6%	352,577	380,648	295,314	-85,334	-22.4%
Total		**7,833**	**7,966**	**6,325**	**-1,641**	**-20.6%**	**352,577**	**380,648**	**295,314**	**-85,334**	**-22.4%**

Source: OAG Schedule Tapes.

Table F-9 Scheduled Passenger Operations by Market and Carrier for Tweed-New Haven Airport

		Departures					Seats				
Carrier	Market	2004	2005	2006	Change	Percent Change	2004	2005	2006	Change	Percent Change
Regional/Commuter Carriers											
US Airways Express	Philidelphia	1,372	1,910	2,071	161	8.4%	50,780	76,255	77,477	1,222	1.6%
Delta Connection/Comair	Cincinnati	642	1,029		-1,029		32,100	51,330		-51,330	
Total		**2,014**	**2,939**	**2,071**	**-868**	**-29.5%**	**82,880**	**127,585**	**77,477**	**-50,108**	**-39.3%**

Source: OAG Schedule Tapes.

Table F-10 Scheduled Passenger Operations by Market and Carrier for Worcester Regional Airport

		Departures					Seats				
Carrier	Market	2004	2005	2006	Change	Percent Change	2004	2005	2006	Change	Percent Change
Regional/Commuter Carriers											
US Airways Express	Philadelphia		4		-4			596		-596	
Allegiant Air	Orlando/Sanford			181	181				27,279	27,279	
	Total	**0**	**4**	**181**	**177**	**4425.0%**	**0**	**596**	**27,279**	**26,683**	**4477.0%**

Source: OAG Schedule Tapes.

Table F-11 Scheduled Passenger Operations by Market and Carrier for Hanscom Field

		Departures					Seats				
Carrier	Market	2004	2005	2006	Change	Percent Change	2004	2005	2006	Change	Percent Change
Regional/Commuter Carriers											
Pan Am/Boston and Maine	Portsmouth	336	192	251	59	30.7%	6,051	3,445	4,520	1,075	31.2%
Pan Am/Boston and Maine	New London/Groton	61	9		-9		1,101	157		-157	
Pan Am/Boston and Maine	Trenton	987		982	982		17,763		17,692	17,692	
Shuttle America	Trenton	777	863		-863		25,627	15,503		-15,503	
Total		**2,161**	**1,064**	**1,233**	**169**	**15.9%**	**50,541**	**19,105**	**22,212**	**3,107**	**16.3%**

Source: OAG Schedule Tapes.

Table F-12 Scheduled Passenger Operations by Market and Carrier for Pease International Tradeport

		Departures					Seats				
Carrier	Market	2004	2005	2006	Change	Percent Change	2004	2005	2006	Change	Percent Change
Jet Carriers											
Alliegiant Airways	Orlando Sanford		35	191	156	445.7%		5,220	28,578	23,358	447.5%
Pan American Airways	Manchester	170			0		25,543			0	
Pan American Airways	Sanford	261			0		39,107			0	
Subtotal		431	35	191	156	445.7%	64,650	5,220	28,578	23,358	447.5%
Regional/Commuter Carriers											
Pan Am/Clipper Connection	Bedford	420	170	221	51	30.0%	7,552	3,053	3,975	922	30.2%
Pan Am/Clipper Connection	Fort Lauderdale/Hollywood	9	13		-13		1,329	1,957		-1,957	
Pan Am/Clipper Connection	Hartford		13		-13			1,957		-1,957	
Pan Am/Clipper Connection	Manchester	4			0		80			0	
Pan Am/Clipper Connection	Martha's Vineyard	22			0		399			0	
Pan Am/Clipper Connection	Nantucket	82			0		1,476			0	
Pan Am/Clipper Connection	Newburgh		48		-48			7,178		-7,178	
Pan Am/Clipper Connection	New London/Groton	217			0		3,901			0	
Pan Am/Clipper Connection	Saint John, Canada	173			0		3,111			0	
Pan Am/Clipper Connection	Sanford	57	57		-57		8,507	8,483		-8,483	
Pan Am/Clipper Connection	Trenton		22		-22			391		-391	
Pan Am/Clipper Connection	Westchester County	43			0		782			0	
Subtotal		1,027	323	221	-102	-31.6%	27,136	23,019	3,975	-19,044	-82.7%
Total		**1,458**	**358**	**412**	**54**	**15.1%**	**91,786**	**28,239**	**32,553**	**4,314**	**15.3%**

Note: Pan Am/Clipper Connection is Operated by Boston-Maine Airways, a subsidiary of Pan American Airways.

Source: OAG Schedule Tapes.

G

Ground Transportation

This Appendix provides information in support of *Chapter 5, Ground Transportation*:

- Table G-1 Logan Express Bus Service Ridership
- Table G-2 Water Transportation Services Ridership
- Table G-3 Massachusetts Bay Transportation Authority (MBTA) Airport Station Passengers
- Table G-4 Logan Airport Employee Parking Supply (September 2006)
- Table G-5 Logan Airport Commercial Parking Supply (September 2006)

Table G-1	Logan Express Bus Service Ridership					
	Ridership			Percent Change		
Service Year	Air Passengers	Employees	Total	Air Passengers	Employees	Total
Framingham						
1992	207,847	7,573	215,420	4.3%	21.3%	4.8%
1993	229,064	12,307	241,371	10.2%	62.5%	12.0%
1994	250,342	17,352	267,694	9.3%	41.0%	10.9%
1995	274,754	21,129	295,883	9.8%	21.8%	10.5%
1996	325,665	22,932	348,597	18.5%	8.5%	17.8%
1997	316,306	29,871	346,175	(2.9)%	30.3%	(0.7)%
1999	345,715	31,946	380,661	3.5%	(6.0)%	2.6%
2000	371,560	34,508	406,068	6.6%	8.0%	6.7%
2001	354,521	38,740	393,261	(4.6)%	12.3%	(3.2)%
2002	342,746	42,441	385,187	(3.3)%	8.7%	(2.1)%
2003	310,024	55,979	366,003	(9.5)%	31.9%	(5.0)%
2004	323,931	54,763	378,694	4.5%	(2.2%)	3.5%
2005	318,125	57,569	375,694	(1.8%)	5.1%	(0.8%)
2006	**349,022**	**60,764**	**409,789**	**9.7%**	**5.5%**	**9.1%**
Braintree[1]						
1992	186,217	9,694	195,911	10.6%	16.6%	10.8%
1993	205,209	22,768	227,977	10.2%	134.9%	16.4%
1994	247,636	37,489	285,125	20.7%	64.7%	25.1%
1995	264,579	70,723	335,302	6.8%	88.7%	17.6%
1996	335,232	103,519	438,751	26.7%	46.4%	30.1%
1997	300,006	135,340	435,346	(10.5)%	30.7%	(0.8)%
1999	328,818	125,286	454,105	9.6%	(19.7)%	(0.5)%
2000	355,932	149,687	505,619	8.2%	19.5%	11.3%
2001	345,249	156,240	501,489	(3.0)%	4.4%	(0.8)%
2002	323,115	190,360	513,475	(6.4)%	21.8%	2.4%
2003	301,013	216,765	517,778	(6.8)%	13.9%	0.8%
2004	318,100	208,566	526,666	5.7%	(3.8%)	1.7%
2005	307,659	189,531	497,190	(3.2%)	(9.1%)	(5.5%)
2006	**333,413**	**202,983**	**536,396**	**8.4%**	**7.1%**	**7.9%**
Woburn						
1992[2]	3,052	91	3,143	NA	NA	-
1993	59,635	5,027	64,662	NA	NA	-
1994	119,567	9,082	128,649	100.5%	80.7%	99.0%
1995	150,147	13,376	163,523	25.6%	47.3%	27.1%
1996	190,566	17,322	207,888	26.9%	29.5%	27.1%
1997	199,715	20,018	219,733	4.8%	15.6%	5.7%
1998	208,286	22,876	231,162	4.3%	14.3%	5.2%
1999	191,454	23,495	514,949	(8.1)%	2.7%	(7.0)%
2000	195,744	27,522	223,266	2.2%	17.1%	3.9%
2001	177,375	38,318	215,530	(9.4)%	39.2%	(3.4)%
2002	161,145	73,277	234,422	(9.2)%	91.0%	8.7%
2003	164,980	103,963	268,943	(2.4)%	41.9%	14.7%
2004	172,110	111,326	283,436	4.3%	7.1%	5.4%
2005	163,227	110,961	274,188	(5.1%)	(0.3%)	(3.2%)
2006	**167,341**	**121,672**	**289,013**	**2.5%**	**9.7%**	**5.4%**

Table G-1 Logan Express Bus Service Ridership (continued)

	Ridership			Percent Change		
Service Year	**Air Passengers**	**Employees**	**Total**	**Air Passengers**	**Employees**	**Total**
Peabody						
2001[3]	8,151	3,097	11,248	NA	NA	NA
2002	28,626	20,629	49,255	NA	NA	NA
2003	32,318	23,425	55,743	21.4%	13.6%	13.2%
2004	43,389	33,642	77,031	34.3%	43.6%	38.2%
2005	51,023	39,599	87,622	17.6%	17.7%	13.7%
2006	**42,142**	**32,632**	**74,774**	**(17.4%)**	**(17.6%)**	**(14.7%)**
Total System Ridership						
1992	397,116	17,358	414,474	8.0%	19.2%	8.5%
1993	493,908	39,832	533,740	24.4%	129.5%	28.8%
1994	617,545	63,923	681,468	25.0%	60.5%	27.7%
1995	689,480	105,228	794,708	11.6%	64.6%	16.6%
1996	851,463	143,773	995,236	23.4%	36.6%	25.2%
1997	816,015	185,229	1,001,254	(4.2)%	28.8%	0.6%
1998	845,598	212,952	1,058,550	3.6%	15.0%	5.7%
1999	868,987	180,727	1,049,714	2.7%	(15.2)%	(0.8)%
2000	923,236	211,717	1,134,953	6.2%	17.1%	8.1%
2001	885,296	236,395	1,121,691	(4.1)%	11.7%	(1.2)%
2002	855,632	326,707	1,182,339	(3.4)%	38.2%	5.4%
2003	808,335	400,132	1,208,467	(5.5%)	22.5%	2.2%
2004	857,530	408,297	1,265,827	6.1%	2.0%	2.2%
2005	837,034	397,660	1,234,694	(2.4%)	(2.6%)	(2.4%)
2006	**891,918**	**418,051**	**1,309,969**	**6.6%**	**5.1%**	**6.1%**

NA Information not available.
1 Service originally based from the Quincy-Adams Massachusetts Bay Transportation Authority (MBTA) Station.
2 Reflects a partial year of operation; Woburn Logan Express service was implemented in November 1992.
3 The Peabody Logan Express service commenced in September 2001.

Table G-2 Water Transportation Services Ridership[1]

	Rowes Wharf/Fan Pier Water Shuttle	Private Water Taxi (on-demand)[3]	Harbor Express (Long Wharf/Quincy/Hull)	Boston-Logan Water Shuttle (Long Wharf)	Total
1990	181,530	NS	NS	NS	181,530
1991	142,500	NS	NS	NS	142,500
1992	133,297	NS	NS	NS	133,297
1993	159,525	NS	NS	NS	159,525
1994	209,057	NS	NS	NS	209,057
1995	203,829	NS	NS	NS	203,829
1996	159,992	3,364	1,1781	NS	175,137
1997	132,542	6,299	7,1309	NS	210,150
1998	124,836	9,243	10,1174	NS	235,253
1999	122,211	17,252	98,539	NS	238,002
2000	128,097	26,335	83,243	NS	237,675
2001	107,400	29,642	82,704	NS	219,746
2002	75,304	36,736	85,652	NS	197,692
2003	19,853[2]	33,194[4]	61,849	5,762[5]	120,658
2004	9,467	45,073	57,953	3,202[6]	112,493
2005	NA	NA	NS	NS	50,000
2006	**9,038**	**53,888**	**51,474**	**713**	**115,113**

Source: Massport, Port Planning and Development.
1 To and from Logan Airport.
2 Rowes Wharf Water Shuttle operated from January to June only in 2003.
3 Operates April-October only.
4 Operated from May to October only in 2003.
5 Long Wharf Boston-Logan Water Shuttle operated from August to December in 2003.
6 Joint operation with City Water Taxi began on August 16, 2003.
NA Information not available.
NS Not in service.

Table G-3 Massachusetts Bay Transportation Authority (MBTA) Airport Station Passengers

Year	Turnstile Count[1]	Percent Change
1990	2,854,317	-
1991	2,515,293	(11.9)%
1992	2,626,572	4.2%
1993	2,604,980	(0.8)%
1994	3,108,734	19.3%
1995	3,040,868	(2.2)%
1996	2,974,850	(2.2)%
1997[2]	2,774,268	(6.7)%
1998	2,850,367	2.7%
1999	2,974,045	4.3%
2000	3,019,086	1.5%
2001	2,896,638	(4.1)%
2002	2,670,594	(7.8)%
2003[3]	2,575,899	(3.6)%
2004	2,740,372	6.4%
2005	NA	NA
2006	**NA**	**NA**

Source: MBTA.
Note: Turnstile counts include both Logan Airport bound and non-Logan Airport bound passengers.
1 As stated in the *Logan Airport 1999 ESPR*, Massport believes that these ridership estimates are actually understated because many travelers that are destined for the airport with baggage have been observed to avoid the turnstiles and exit Airport Station via the wide gate (designed for handicapped access) that does not have the capability to count passengers.
2 Airport Station was closed on six weekends during September and October 1997 due to construction.
3 Airport Station was closed on eight weekend days during 2003.
NA Information not available.

Table G-4 Logan Airport Employee Parking Supply (September 2006)

In-Service Spaces			Out-of-Service Spaces		
	Number of Spaces			Number of Spaces	
Location	**2004**	**2006**	**Location**	**2004**	**2006**
Terminal Area	427	553	Terminal Area	894	768
North Service Area	988	915	North Service Area	520	593
Southwest Service Area	10	10	Southwest Service Area	152	152
South Service Area	1,434	1,260	South Service Area	800	974
Total spaces in service	**2,859**	**2,738**	**Total spaces out of service**	**2,366**	**2,487**
			Total employee spaces	**5,225**	**5,225**

Source: Logan Airport Parking Space Inventory submitted to Massachusetts Department of Environmental Protection (MDEP), September 2006.
Notes: Total number of spaces under the Logan Airport Parking Freeze are 20,692, with 5,225 designated as employee parking spaces.
2005 data not available.

Table G-5 Logan Airport Commercial Parking Supply (September 2006)

In-Service Spaces			Out-of-Service Spaces		
	Number of Spaces			Number of Spaces	
Location	**2004**	**2006**	**Location**	**2004**	**2006**
Terminal Area					
Central Garage and West Garage	7,242	6,442	Terminal Area	2,092	2,050
Terminal B Garage	2,692	2,692	North Service Area	929	434
Citgo Valet Lot	0	300	Southwest Service Area	0	0
Logan Airport Hilton	270	270	South Service Area	359	359
Terminal E1	NA	262			
Terminal E2	NA	280			
North Service Area					
Economy Lot 1	200	NA			
Economy Lot 2	670	965			
Sky Chef Valet Lot	NA	400			
South Service Area					
Harborside Hyatt Conference Center and Hotel	215	215			
Southwest Service Area					
Former USPS Site	403	430			
Total spaces in service	**11,692**	**12,256**	**Total spaces out of service**	**3,775**	**3,211**
			Total commercial spaces	**15,467**	**15,467**

Source: Logan Airport Parking Space Inventory submitted to MDEP, September 2006.
Notes: Total number of spaces under the Logan Airport Parking Freeze are 20,692, with 15,467 designated as commercial parking spaces.
2005 data not available.
NA Information not available.

H

Noise Abatement

This appendix provides detailed information, tables, and figures in support of *Chapter 6, Noise Abatement*:

Logan Airport RealContours™ Data Inputs

For this *2006 EDR*, Massport has produced a set of noise contours, time above (TA) noise metrics, and population counts for 2006 using the pair of software packages RealProfiles™ and RealContours™. This software incorporates the latest version of the Federal Aviation Administration (FAA) Integrated Noise Model (INM) Version 6.2a as the computational "engine" for calculating noise, but uses individual flight tracks taken directly from the Massport radar system rather than relying on consolidated data summaries. For 2006, the radar systems retained suitable data for 363,563 flights; all of these were used in the noise model directly.

Introduction

Standard INM methodology involves development of operational inputs and calculation of the Day-Night Sound Level (DNL) for a prototypical average annual day. This approach requires manually collecting, refining, and entering the enormous amount of data related to a full year of activity at an airport. For example, the model inputs may include an aircraft fleet mix with several dozen representative aircraft types, numerous representative flight tracks (on the order of 100 to 300 is common for an airport comparable to Logan Airport), and runway use and flight track use percentages for three or four categories of aircraft types with similar performance characteristics.

This approach meets accepted professional standards, and reduces the effort and cost that would be associated with manually entering the parameters for every actual operation. However, it represents a significant simplification of the extraordinary diversity of actual aircraft operations over a year. It also does not take full advantage of the investment that Massport has made in installing and maintaining a state-of-the-art radar system[1], which automatically collects flight track data and flight identification data for all operations at the Airport.

For this report, Massport has selected an INM pre-processor, named RealContours™, which takes maximum possible advantage of both the INM's capabilities and the investment that the Massport has made in operations monitoring. RealContours™ automates the process of preparing the INM inputs directly from the actual flight operations, and permits airports to model the full diversity of activity as precisely as possible, at a cost equivalent to the more simplified manual approach. RealContours™ improves the precision of modeling by utilizing operations monitoring results in four key areas:

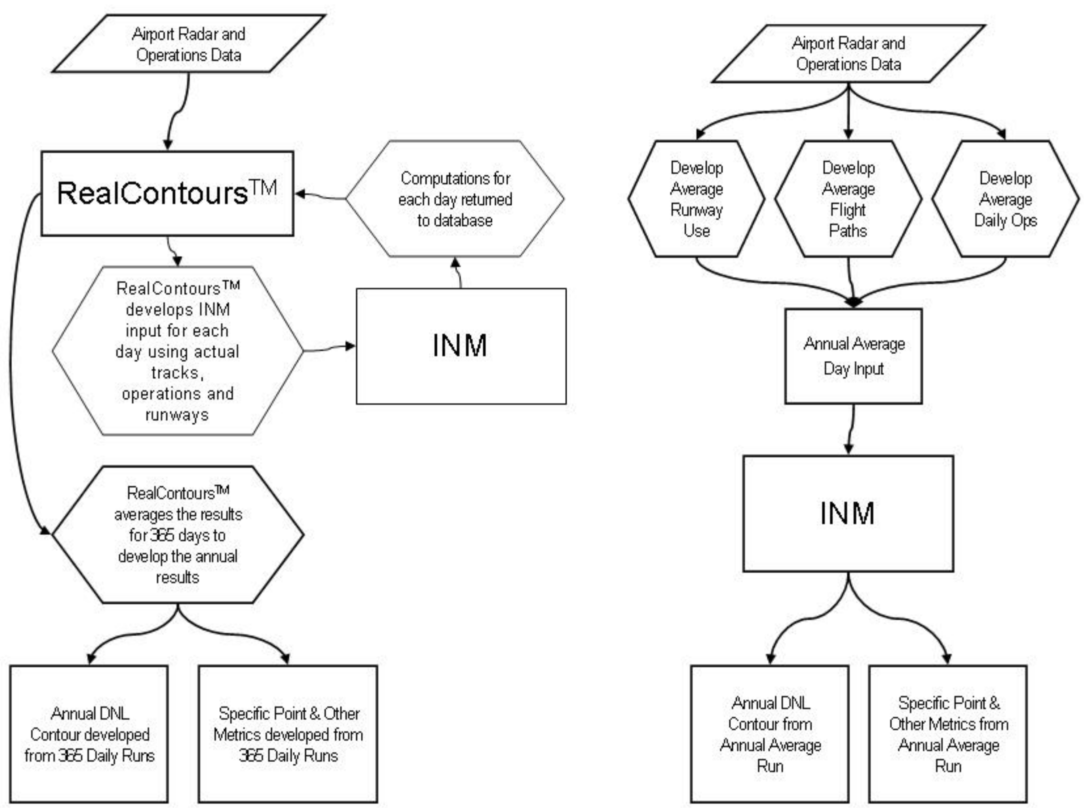
- It directly converts the flight track for every identified aircraft operation to an INM track, rather than assigning all operations to a limited number of prototypical tracks.
- It models each operation on the specific runway that it actually used, rather than applying a generalized distribution to broad ranges of aircraft types.
- It selects the specific airframe and engine combination to model, on an operation-by-operation basis, based on the published composition of the fleets of the specific airlines operating at Logan Airport.
- It uses each aircraft's actual performance and altitude profile to develop inputs to the model which define the actual arrival or departure profile.

1 The Massport system utilizes the PASSUR™ product of Megadata Corporation and the data is processed using PREFlight™ from HMMH.

As defined in the INM User's Guide, the annual day-night average sound level (YDNL) is used for quantifying airport noise. The YDNL means the 365-day average, day-night average sound level. To use this definition to model noise in INM, one would have to run 365 cases of the model and average the results. Since this is time consuming and impractical, the current practice is to average the 365 days of data before the run and design one input file. However, RealContours™ accomplishes this task by using the actual radar data to develop INM input files for each day of the year and then averaging the results to obtain the annual contour.

Figure H-1 provides a schematic representation of the RealContours™ noise modeling process compared to the standard INM process.

Figure H-1 Schematic Noise Modeling Process (Standard INM vs. RealContours™)



2006 Radar Data

Logan Airport's radar data provide the key to the RealContours™ system. Since February 2004, Massport has collected PASSUR radar data which supplies information to the Airport's web-based Airport Monitor software. Massport was able to collect 363 complete days of data for 2006, with approximately 91 percent of these tracks

usable for the development of the noise exposure contours. Massport was unable to collect data for two days in December when the radar data system was down

Fleet Mix

The 2006 radar data first were processed to establish a baseline set of operations. After processing 363 days of radar data, 363,563 flight tracks with sufficient data were identified to use as the baseline for the 2006 contour. The operations from these tracks were then scaled upwards by airline and aircraft type to match the reported totals for 2006. Table H-1 provides the scaled annual operations, as modeled, by aircraft type. The INM aircraft types modeled by RealContours™ match the types listed in Table H-1.

Runway Use

RealContours™ obtains its runway use information directly from the radar data based on the actual runways which were used each day throughout the modeled year. The runway use presented here is broken into six representative aircraft groups listed below: (see Table H-2).

- Heavy Jet A – B747s, A340s, DC-8s
- Heavy Jet B – B767s, B777s, A300s, A310s, A330s, DC-10s, L1011s, MD-11s
- Light Jet A – B717s, B727s, DC-9s, F100s, MD-90s
- Light Jet B – B737s, B757s, A319s, A320s, B-146s, MD-80s
- Regional Jet – E135, E145, E170, E190, CRJ2, CRJ7, CRJ9, J328 and Corporate Jets
- Turboprops (Non-Jets)

The runway use has been grouped in this format to allow comparison with prior years.

Table H-2 shows the runway use that was used to model the 2006 noise conditions. As described above, turbojet aircraft in the table were grouped into different categories for reporting purposes. Because the 2006 contour developed using RealContours™ reflects the individual use of the runways by each INM aircraft type, it accurately represents Logan Airport's noisiest aircraft by modeling them on the actual runways that they used during the year. The modeled runway use for each particular aircraft type may be different than the overall group runway use presented in Table H-2.

Table H-1 2006 Annual Modeled Operations

INM Type	Runway Use Group	Arrivals Day	Arrivals Night	Departures Day	Departures Night	Total
Commercial Jet Operations						
717200	LJA	9546	969	9396	1119	21030
727EM1	LJA	17	96	63	50	226
727EM2	LJA	582	1000	368	1213	3164
727Q9	LJA	6	1	2	5	14
727QF	LJA	13	8	10	11	41
737300	LJB	2589	232	2435	386	5642
7373B2	LJB	2520	354	2509	364	5747
737400	LJB	1062	64	770	356	2252
737500	LJB	3891	320	4026	186	8423
737700	LJB	1649	822	1780	691	4941
737800	LJB	2503	850	3069	284	6707
737900	LJB	159	141	299	1	600
737N17	LJB	210	116	322	4	651
737N9	LJB	34	3	35	2	73
74720B	HJA	971	10	927	53	1961
747400	HJA	13	0	13	0	27
757300	LJB	46	216	253	9	525
757PW	LJB	10339	3193	12408	1124	27063
757RR	LJB	6037	1302	6453	886	14676
767300	HJB	965	47	954	58	2024
767CF6	HJB	39	3	37	5	84
777200	HJB	1237	86	1311	13	2647
A300	HJB	2	2	3	0	6
A30062	HJB	445	1041	697	788	2971
A310	HJB	175	13	26	162	377
A319	LJB	15253	2190	15728	1715	34886
A320	LJB	1784	677	1871	591	4923
A32023	LJB	8077	3689	10576	1190	23531
A330	HJB	1223	6	1210	20	2459
A33034	HJB	22	0	17	4	43
A340	HJA	1266	3	1109	160	2538
DC1010	HJB	366	162	186	342	1056
DC1030	HJB	218	108	130	196	652
DC86HK	HJA	0	5	0	4	9
DC870	HJA	8	22	3	27	59
DC93LW	LJA	97	1	96	1	195
DC95HW	LJA	200	2	198	4	405
MD11GE	HJB	2	6	3	5	16
MD11PW	HJB	1	0	1	0	2
MD81	LJB	44	3	41	7	95
MD82	LJB	2984	896	3616	265	7761
MD83	LJB	9521	1690	10015	1196	22421

Table H-1 2006 Annual Modeled Operations (continued)

INM Type	Runway Use Group	Arrivals Day	Arrivals Night	Departures Day	Departures Night	Total
Commercial Jet Operations						
CL601	RJ	19410	1666	19920	1156	42153
EMB145	RJ	17932	1379	17960	1351	38622
EMB14L	RJ	4117	198	4151	163	8629
EMB17C	RJ	1217	125	1158	184	2683
EMB19C	RJ	6885	930	6996	819	15630
FAL20	RJ	3	0	2	1	6
GIV	RJ	5	0	4	2	11
GV (CRJ700 & CRJ900)	RJ	621	93	707	7	1428
LEAR25	RJ	3	0	2	1	6
LEAR35	RJ	1	0	1	0	2
	Total	**136309**	**24735**	**143866**	**17178**	**322088**
Commercial Non-Jet Operations						
1900D	NJ	8912	678	9497	93	19179
BEC58P	NJ	13400	236	13526	109	27271
DHC6	NJ	6	0	6	0	12
DHC8	NJ	1561	3	1555	9	3129
DHC830	NJ	143	0	143	0	286
GASEPF	NJ	8	0	8	0	16
SF340	NJ	1327	21	1306	41	2695
	Total	**25356**	**938**	**26041**	**252**	**52587**
	Commercial Sub-total	**161665**	**25673**	**169907**	**17431**	**374675**
General Aviation Operations						
727EM2	LJA	9	8	12	6	35
727QF	LJA	1	0	1	0	3
7373B2	LJB	1	0	0	1	3
737400	LJB	0	1	0	1	3
737700	LJB	16	5	17	4	43
737N17	LJB	8	0	8	0	16
74720B	HJA	1	0	1	0	3
757PW	LJB	0	1	1	0	3
767300	HJB	4	1	4	1	11
767CF6	HJB	4	0	4	0	8
CIT3	RJ	162	17	168	10	357
CL600	RJ	711	63	729	44	1546
CL601	RJ	603	69	610	61	1344
CNA500	RJ	356	21	358	20	754
CNA750	RJ	660	114	708	65	1546
DC870	HJA	9	0	4	5	19
EMB145	RJ	66	4	64	7	141
FAL50	RJ	270	26	275	21	592

Table H-1 2006 Annual Modeled Operations (continued)

		Arrivals		Departures		
INM Type	Runway Use Group	Day	Night	Day	Night	Total
FAL900	RJ	310	41	318	33	703
FAL20	RJ	3	0	3	0	5
GII	RJ	53	3	55	0	111
GIIB	RJ	243	36	266	14	560
GIV	RJ	802	88	807	84	1782
GV	RJ	377	34	378	33	822
IA1125	RJ	542	41	549	34	1165
J328	RJ	4	1	0	5	11
LEAR25	RJ	34	5	36	4	78
LEAR35	RJ	2812	291	2763	339	6204
MD81	LJB	1	0	1	0	3
MU3001	RJ	3380	407	3401	387	7575
1900D	NJ	7	0	7	0	14
BEC58P	NJ	540	71	527	84	1222
CNA172	NJ	77	0	77	0	154
CNA206	NJ	119	0	119	0	238
CNA20T	NJ	8	1	9	0	19
CNA441	NJ	315	23	295	43	676
CVR580	NJ	1	0	1	0	3
DHC6	NJ	457	37	454	41	989
GASEPF	NJ	160	27	167	20	373
GASEPV	NJ	448	17	452	13	930
PA28	NJ	43	0	43	0	87
PA31	NJ	96	6	96	7	205
EMB120	NJ	3	0	3	0	5
SD330	NJ	485	54	479	61	1079
HS748A	NJ	3	0	3	0	5
	Total	**14205**	**1517**	**14274**	**1448**	**31444**
	Grand Total	**175870**	**27190**	**184181**	**18879**	**406119**

Notes: Annual operations converted to daily operations for noise modeling.
User Defined Aircraft.
HJA, HJB Heavy Jets A and B.
LJA, LJB Light Jets A and B.
RJ Regional Jets.
NJ Non-jets.

Table H-2 2006 Modeled Runway Use by Aircraft Group

ARRIVALS

	Heavy Jets - Group A		Heavy Jets - Group B		Light Jets - Group A		Light Jets - Group B		Regional Jets		Turboprops (Non-jets)	
Runway	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night
4L	2.10%	0.00%	1.62%	0.23%	4.21%	1.32%	3.80%	2.20%	12.25%	5.48%	19.65%	9.88%
4R	40.71%	5.07%	37.45%	26.45%	32.71%	27.30%	34.06%	26.30%	24.38%	23.87%	18.78%	18.68%
9	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
14	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
15L	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.25%	0.00%
15R	2.11%	0.00%	1.33%	1.35%	1.23%	0.81%	1.01%	0.79%	1.18%	1.16%	1.56%	0.65%
22L	21.40%	64.82%	10.48%	21.81%	5.62%	14.77%	11.61%	16.97%	16.41%	15.66%	19.98%	25.24%
22R	0.00%	0.00%	0.00%	0.00%	0.06%	0.05%	0.01%	0.00%	0.04%	0.06%	3.34%	2.90%
27	19.53%	7.98%	36.60%	19.38%	40.63%	27.80%	35.40%	26.71%	30.47%	30.24%	23.96%	15.69%
32	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.01%	0.00%	0.47%	0.00%	0.70%	0.08%
33L	14.15%	22.13%	12.53%	30.78%	15.54%	27.96%	14.10%	27.03%	14.81%	23.54%	9.47%	26.43%
33R	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	2.31%	0.46%
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

DEPARTURES

	Heavy Jets - Group A		Heavy Jets - Group B		Light Jets - Group A		Light Jets - Group B		Regional Jets		Turboprops (Non-jets)	
Runway	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night
4L	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.01%	0.00%	14.03%	7.67%
4R	26.90%	24.19%	16.25%	3.79%	1.13%	2.10%	6.16%	4.18%	1.25%	1.33%	2.45%	4.01%
9	10.15%	4.30%	18.62%	23.85%	37.39%	28.40%	31.39%	26.86%	36.79%	29.46%	3.89%	5.77%
14	0.00%	0.00%	0.00%	0.00%	0.01%	0.00%	0.00%	0.00%	0.02%	0.02%	0.01%	0.00%
15L	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.19%	0.29%
15R	7.61%	14.91%	4.50%	9.38%	1.29%	9.05%	2.20%	5.39%	1.93%	11.01%	20.01%	22.70%
22L	0.76%	1.43%	0.66%	0.49%	0.76%	0.75%	1.21%	1.07%	0.64%	0.35%	2.22%	0.44%
22R	41.02%	39.92%	42.19%	43.60%	41.07%	40.44%	39.78%	41.59%	40.74%	38.82%	27.40%	13.16%
27	1.62%	1.44%	5.42%	13.25%	13.01%	14.14%	11.86%	14.61%	14.29%	15.54%	19.00%	33.59%
32	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
33L	11.94%	13.81%	12.36%	5.63%	5.34%	5.12%	7.40%	6.30%	4.33%	3.47%	9.67%	12.07%
33R	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.14%	0.29%
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Flight Tracks

RealContours™ converts each radar track to an INM model track and then models the scaled aircraft operation on that track. This method keeps the lateral and vertical dispersion of the aircraft types consistent with the radar data, and ensures that anomalies in the departure paths are captured in the RealContours™ system. Table H-3 lists the number of flight tracks used in the RealContours™ modeling system for 2006.

Table H-3 Total Count of Flight Tracks Modeled in RealContours™ (2006)

	Runway											
	4L	4R	9	14	15L	15L	22L	22R	27	32	33L	33R
Departures	3,298	7,672	53,095	17	184	7680	1,903	70,127	24,302	0	12,290	34
Arrivals	14,592	51,741	0	0	43	2,091	27,316	782	57,022	410	28,592	418

Flight Profiles

To further enhance the results from RealContours™, Massport elected to use the companion RealProfiles™ software. By using the actual radar information along with the equations developed for the INM, RealProfiles™ develops an altitude profile for each aircraft operation. This profile is then modeled in the RealContours™ system. As a result, the modeled aircraft follows both the actual radar track on the ground and the actual radar altitude profile in the sky.

RealProfiles™ provides several advantages over the standard INM profile modeling. The standard INM modeling uses a "Stagelength" to identify an aircraft's departure weight and then models a standard departure profile for that Stagelength. Using Realprofiles™, the RealContours™ system selects a weight similar to the standard modeling but then develops a profile to allow the INM aircraft to follow the actual path flown for that route. For example, if aircraft departing from a particular runway are required to remain level at 3,000 feet for a certain distance, RealProfiles™ will develop a profile that remains level for that distance along the track. In contrast, the standard modeling would use the standard INM profile and would not model the level segment.

RealProfiles™ was able to compute profiles based on the actual radar data for 85.4 percent of the available flight tracks. Most of the 14.6 percent that could not be used for RealProfiles™ were arrivals. The standard INM arrival profile was used for arriving aircraft that did not have the necessary data in the INM database to be used in RealProfiles™.

Residential Sound Insulation Program

In 2006, Massport completed sound insulation of 296 residential buildings containing 857 dwelling units, resulting in a total of 4,901 residential buildings and 9,943 dwelling units that have been sound insulated since 1986 when the program was first implemented. The total for 2006 represents the greatest number of dwelling units treated in a single year since the beginning of Massport's sound insulation program. Table H-4 lists the yearly progress of this mitigation effort.

Table H-4 Residential Sound Insulation Program Status (1986-2006)

Construction Year	Residential Buildings[1]	Dwelling Units[2]
1986	4	8
1987	43	51
1988	102	159
1989	94	133
1990	121	200
1991	175	360
1992	197	354
1993	318	654
1994	310	542
1995	372	753
1996	323	577
1997	364	808
1998	328	806
1999	330	718
2000	195	601
2001	260	278
2002	205	354
2003	230	468
2004	320	791
2005	314	471
2006	296	857
Total	**4,901**	**9,943**

1 Includes multiple units.
2 Individual units.

Following the FAA's approval of model adjustments based on the effects of terrain (discussed in the *1999 ESPR*) Massport submitted, and the New England Region of the FAA approved, a new sound insulation program. The revised contour, approved for a two-year period beginning in 1999, included dwelling units in East Boston, South Boston, and Winthrop that previously had not been eligible for insulation. Massport received notice of FAA funding in the amount of $5 million. Subsequently, Massport updated its program contour, first with the *2001 EDR* contour and more recently with the Logan Airside Improvements Project approved contour. These updates have allowed Massport to continue the program with additional funds every year since 1999. This latest update takes into account runway use changes due to the new Runway 14-32 which opened in late 2006. This update expands the focus of the sound insulation program into Chelsea.

Table H-5 provides a list of all schools that have been treated under Massport's sound insulation program. To date, Massport has provided sound insulation to 36 schools at a cost of over $8 million.

Table H-5 Schools Treated Under Massport Sound Insulation Program

	Boston:	
	East Boston:	
	East Boston High	$381,948
	St. Mary's Star of the Sea	$80,901
	St. Dominic Savio High	$127,879
	St. Lazurus	$46,092
	James Otis	$46,092
	Samuel Adams	$120,650
	Curtis Guild	$180,572
	Dante Alighieri	$97,750
	P.J. Kennedy	$127,637
	Donald McKay	$231,754
	Hugh Roe O'Donnell	$113,564
	E Boston Central Catholic	$391,768
	Manassah Bradley	$237,500
13	**East Boston Schools**	**$2,184,107**
	South Boston:	
	St. Augustine	$92,855
	Cardinal Cushing	$47,276
	Patrick Gavin	$217,077
	St. Bridgid's	$112,100
	Oliver Hazard Perry	$337,538
	Condon School	$294,481
6	**South Boston Schools**	**$1,101,327**
	Roxbury & Dorchester:	
	Samuel Mason	$192,401
	Dearborn Middle	$248,238
	Ralph Waldo Emerson	$155,851
	Lewis Middle	$202,092
	Nathan Hale Elem.	$92,302
	Phillis Wheatley Elem.	$290,794
	Davis Ellis Elem.	$253,663
	Henry L. Higginson	$119,543
8	**Roxbury & Dorchester Schools**	**$1,554,884**
27	**Total Boston Schools**	**$4,840,318**
	Winthrop:	
	Winthrop Jr. High School	$63,756
	E. B. Newton	$184,674
	A. T. Cummings (Ctr.) School	$800,000
3	**Total Winthrop Schools**	**$1,048,430**
	Revere:	
	Beachmont School	$854,864
1	**Total Revere School**	**$854,864**
	Chelsea:	
	Shurtleff School	$292,207
	Williams School	$486,258
	St. Rose Elementary	$46,396
	St. Stanislaus	$66,298
	Chelsea High School	$524,249
5	**Total Chelsea Schools**	**$1,415,408**
36	**Total Schools**	**$8,159,020**

Source: Massport.

Noise Exposed Population

Table H-6 presents the noise exposed population by community for 2006. This table includes population within the 60-65 dB DNL contours, although a DNL of 65 dB is the federally-defined noise criterion used as a guideline to identify when residential land use is considered incompatible with aircraft noise. The table contains two lines for each version of the INM 2006 census results.

Table H-6 Noise-Exposed Population by Community

Year	Census Data	80+ dB DNL	75-80 dB DNL	70-75 dB DNL	65-70 dB DNL[1]	Total (65+)	60-65 dB DNL
BOSTON[2]							
1990	1980	0	0	1,778	28,970	30,748	NA
1992	1980	0	0	800	4,316	5,116	NA
1993	1980	0	0	264	2,820	3,084	NA
1994	1990	0	106	265	7,698	8,069	30,895
1995	1990	0	106	851	8,815	9,772	33,765
1996	1990	0	106	374	8,775	9,255	40,992
1997	1990	0	106	719	13,857	14,682	54,804
1998	1990	0	58	580	10,877	11,515	52,201
1999[3]	1990	0	58	364	11,632	12,054	45,948
2000[3]	1990	0	58	183	7,880	8,121	32,474
2000[3]	2000	0	0	234	9,014	9,248	35,785
2001[3]	2000	0	0	315	6,515	6,700	27,778
2002[3]	2000	0	0	132	2,625	2,757	23,225
2003[3]	2000	0	0	164	1,730	1,894	21,763
2004[3,4]	2000	0	65	192	4,142	4,399	24,473
2005[3,4]	2000	0	65	104	2,020	2,189	17,661
2006[4]	2000	0	65	192	758	1,015	15,713
2006 (v6.2a)[4]	**2000**	**0**	**65**	**99**	**1,054**	**1,218**	**14,866**
CHELSEA							
1990	1980	0	0	0	4,813	4,813	NA
1992	1980	0	0	0	3,952	3,952	NA
1993	1980	0	0	0	0	0	NA
1994	1990	0	0	0	0	0	8,510
1995	1990	0	0	0	95	95	9,750
1996	1990	0	0	0	0	0	8,744
1997	1990	0	0	0	0	0	10,001
1998	1990	0	0	0	0	0	9,222
1999	1990	0	0	0	95	95	9,249
2000	1990	0	0	0	0	0	5,622
2000	2000	0	0	0	0	0	7,361
2001	2000	0	0	0	0	0	4,508
2002	2000	0	0	0	0	0	3,995
2003	2000	0	0	0	0	0	3,591
2004[4]	2000	0	0	0	0	0	7,756
2005[4]	2000	0	0	0	0	0	5,772
2006[4]	2000	0	0	0	0	0	2,624
2006 (v6.2a)[4]	**2000**	**0**	**0**	**0**	**0**	**0**	**2,477**

Table H-6 Noise-Exposed Population by Community (Continued)

Year	Census Data	80+ dB DNL	75-80 dB DNL	70-75 dB DNL	65-70 dB DNL[1]	Total (65+)	60-65 dB DNL
EVERETT							
1990	1980	0	0	0	0	0	NA
1992	1980	0	0	0	0	0	NA
1993	1980	0	0	0	0	0	NA
1994	1990	0	0	0	0	0	0
1995	1990	0	0	0	0	0	0
1996	1990	0	0	0	0	0	0
1997	1990	0	0	0	0	0	0
1998	1990	0	0	0	0	0	0
1999[3]	1990	0	0	0	0	0	0
2000[3]	1990	0	0	0	0	0	0
2000[3]	2000	0	0	0	0	0	0
2001[3]	2000	0	0	0	0	0	0
2002[3]	2000	0	0	0	0	0	0
2003[3]	2000	0	0	0	0	0	0
2004[3,4]	2000	0	0	0	0	0	0
2005[3,4]	2000	0	0	0	0	0	0
2006[4]	2000	0	0	0	0	0	0
2006 (v6.2a) [4]	**2000**	**0**	**0**	**0**	**0**	**0**	**0**
MEDFORD							
1990	1980	0	0	0	0	0	NA
1992	1980	0	0	0	0	0	NA
1993	1980	0	0	0	0	0	NA
1994	1990	0	0	0	0	0	0
1995	1990	0	0	0	0	0	0
1996	1990	0	0	0	0	0	0
1997	1990	0	0	0	0	0	0
1998	1990	0	0	0	0	0	0
1999	1990	0	0	0	0	0	0
2000	1990	0	0	0	0	0	0
2000	2000	0	0	0	0	0	0
2001	2000	0	0	0	0	0	0
2002	2000	0	0	0	0	0	0
2003	2000	0	0	0	0	0	0
2004[4]	2000	0	0	0	0	0	0
2005[4]	2000	0	0	0	0	0	0
2006[4]	2000	0	0	0	0	0	0
2006 (v6.2a) [4]	**2000**	**0**	**0**	**0**	**0**	**0**	**0**

Table H-6 Noise-Exposed Population by Community (Continued)

Year	Census Data	80+ dB DNL	75-80 dB DNL	70-75 dB DNL	65-70 dB DNL[1]	Total (65+)	60-65 dB DNL
QUINCY							
1990	1980	0	0	0	0	0	NA
1992	1980	0	0	0	0	0	NA
1993	1980	0	0	0	0	0	NA
1994	1990	0	0	0	0	0	0
1995	1990	0	0	0	0	0	0
1996	1990	0	0	0	0	0	0
1997	1990	0	0	0	0	0	0
1998	1990	0	0	0	0	0	0
1999	1990	0	0	0	0	0	0
2000	1990	0	0	0	0	0	0
2000	2000	0	0	0	0	0	636
2001	2000	0	0	0	0	0	610
2002	2000	0	0	0	0	0	610
2003	2000	0	0	0	0	0	610
2004[4]	2000	0	0	0	0	0	610
2005[4]	2000	0	0	0	0	0	610
2006[4]	2000	0	0	0	0	0	610
2006 (v6.2a) [4]	**2000**	**0**	**0**	**0**	**0**	**0**	**610**
REVERE							
1990	1980	0	0	0	4,274	4,274	NA
1992	1980	0	0	0	3,848	3,848	NA
1993	1980	0	0	0	4,617	4,617	NA
1994	1990	0	0	0	3,569	3,569	2,099
1995	1990	0	0	0	3,364	3,364	2,304
1996	1990	0	0	172	3,292	3,464	2,505
1997	1990	0	0	0	3,293	3,293	2,047
1998	1990	0	0	0	3,168	3,168	2,132
1999	1990	0	0	128	3,165	3,293	2,047
2000	1990	0	0	0	2,552	2,552	2,386
2000	2000	0	0	0	2,496	2,496	3,100
2001	2000	0	0	0	2,496	2,496	3,100
2002	2000	0	0	0	2,822	2,822	2,399
2003	2000	0	0	0	2,994	2,994	2,227
2004[4]	2000	0	0	82	2,969	3,051	2,678
2005[4]	2000	0	0	82	2,540	2,622	2,731
2006[4]	2000	0	0	169	2,843	3,012	2,696
2006 (v6.2a) [4]	**2000**	**0**	**0**	**82**	**2,540**	**2,622**	**2,698**

Table H-6 Noise-Exposed Population by Community (Continued)

Year	Census Data	80+ dB DNL	75-80 dB DNL	70-75 dB DNL	65-70 dB DNL[1]	Total (65+)	60-65 dB DNL
WINTHROP							
1990	1980	0	676	1,211	2,420	4,307	NA
1992	1980	0	626	1,146	2,488	4,262	NA
1993	1980	0	648	1,211	1,773	3,632	NA
1994	1990	0	417	1,343	5,154	6,914	7,512
1995	1990	0	482	1,611	5,757	7,850	7,077
1996	1990	0	417	1,376	5,930	7,723	7,333
1997	1990	0	417	1,659	6,386	8,462	6,839
1998	1990	0	519	1,522	6,572	8,613	6,507
1999	1990	0	353	1,408	5,946	7,707	7,135
2000	1990	0	277	991	5,240	6,508	7,296
2000	2000	0	247	1,070	4,684	6,001	7,776
2001	2000	0	244	683	4,123	5,050	8,104
2002	2000	0	2	481	2,247	2,730	7,921
2003	2000	0	0	339	1,956	2,295	7,386
2004[4]	2000	0	2	337	1,649	1,988	6,508
2005[4]	2000	0	39	347	1,280	1,666	6,353
2006[4]	2000	0	122	333	1,182	1,637	6,518
2006 (v6.2a) [4]	**2000**	**0**	**39**	**416**	**1,288**	**1,743**	**6,845**
All Communities							
1990	1980	0	676	2,989	40,477	44,142	NA
1992	1980	0	628	2,352	14,604	17,584	NA
1993	1980	0	648	1,475	9,210	11,333	NA
1994	1990	0	523	1,608	16,421	18,552	49,016
1995	1990	0	588	2,462	18,031	21,081	52,896
1996	1990	0	523	1,922	17,997	20,442	59,574
1997	1990	0	523	2,378	23,536	26,437	73,691
1998	1990	0	577	2,102	20,617	23,296	70,062
1999	1990	0	411	1,900	20,838	23,149	64,379
2000	1990	0	335	1,174	15,672	17,181	47,778
2000	2000	0	247	1,304	16,194	17,745	54,190
2001	2000	0	244	998	13,004	14,246	43,616
2002	2000	0	2	613	7,694	8,309	38,150
2003	2000	0	0	503	6,680	7,183	35,577
2004[4]	2000	0	67	611	8,760	9,438	41,975
2005[4]	2000	0	104	533	5,840	6,477	33,127
2006[4]	2000	0	187	694	4,783	5,664	28,161
2006 (v6.2a) [4]	**2000**	**0**	**104**	**597**	**4,882**	**5,583**	**27,496**

Source: Data prepared for Massport by HMMH.
NA Not Available.
1 65 dB DNL is the Federally-defined noise criterion.
2 Portions of Dorchester, East Boston, Roxbury, South Boston, and the South End are included in Boston totals.
3 Boston population by community changed in 1999 due to employment of more accurate hill effects methodology and reporting change.
4 All results since 2004 are from the RealContours™ modeling system.

Table H-7 presents a summary by community of the total complaints made in 2005 to Massport's Noise Complaint Line. The Noise Complaint Line provides individuals the ability to express their concerns about aviation noise (activities) or to ask questions regarding noise at Logan Airport. Callers ask a range of questions such as "Why is this runway in use?"; "What time do the planes stop flying?"; and "Was that aircraft off-course?"

The Noise Abatement Office (NAO) staff document noise line complaints by obtaining information from the caller about the nature of the complaint, time of the occurrence, location of caller's residence, and the activity that was disturbed. The NAO uses the collected information to determine the probable activity responsible for the complaint and writes a letter report to the complainant. The letter includes the original complaint, a response that identifies the activity responsible for the call (arrivals, departures, runup, etc.), meteorological information at the time of the call (a major factor in aviation activities), runways in use at the time of the call, and a notice that the FAA will receive a copy of the report.

In 2006, Massport received a total of 3,955 noise complaints from 50 communities, an increase of 33.4 percent from 2005, when the NAO received 2,964 complaints. Eleven communities with more than 100 annual complaints had an increase in calls from 2005. The increase in Lexington was due to a single caller. Only two communities with more than 100 annual complaints had decreases in 2005: Jamaica Plain and Hingham. Possible reasons for the increase in complaints may include the increase from 2005 in departures on Runways 22R and 27 and the increase in arrivals to Runway 22Land 33L. Massport's website, www.massport.com, provides for additional general questions and answers regarding the Noise Complaint Line.

Table H-7 Noise Complaint Line Summary

	2005		2006		Change		2005		2006		Change
Town	Calls	Callers	Calls	Callers	Calls	Town	Calls	Callers	Calls	Callers	Calls
Arlington	3	1	2	2	-1	Marblehead	1	1	0	0	-1
Belmont	1	1	1	1	0	Marshfield	1	1	2	5	1
Beverly	1	1	0	0	-1	Medford	33	18	31	2	-2
Boston	17	10	38	24	21	Melrose	2	2	0	0	-2
Braintree	7	3	4	4	-3	Milton	50	17	110	27	60
Brighton	1	1	1	1	0	Nahant	51	32	318	52	267
Brookline	1	1	8	6	7	Natick	0	0	1	14	1
Burlington	3	1	0	0	-3	Needham	0	0	1	1	1
Cambridge	192	16	367	12	175	Peabody	1	1	4	1	3
Charlestown	0	0	4	3	4	Plymouth	0	0	1	3	1
Chelsea	156	45	260	33	104	Quincy	17	10	11	7	-6
Cohasset	20	10	4	4	-16	Randolph	0	0	2	4	2
Concord	6	1	11	1	5	Revere	22	18	64	32	42
Danvers	1	1	0	0	-1	Roslindale	27	13	33	14	6
Dedham	0	0	4	2	4	Roxbury	176	16	182	18	6
Dorchester	7	6	17	12	10	Salem	4	3	6	3	2
East Boston	75	36	75	36	0	Scitutate	1	1	3	1	2
Easton	1	1	1	1	0	Somerville	46	21	13	8	-33
Everett	54	21	98	25	44	South Boston	67	41	128	54	61
Harvard	1	1	0	0	-1	South End	104	31	111	42	7
Haverhill	1	1	0	0	-1	Stoneham	0	0	1	2	1
Hingham	311	12	242	14	-69	Sudbury	1	1	0	0	-1
Holbrook	1	1	0	0	-1	Swampscott	2	2	9	2	7
Hull	108	27	312	29	204	Wakefield	0	0	2	2	2
Hyde Park	7	3	12	4	5	West Roxbury	2	2	3	2	1
Ipswich	1	1	0	0	-1	Weston	0	0	2	1	2
Jamaica Plain	380	43	218	49	-162	Weymouth	227	2	242	1	15
Lexington	500	1	642	1	142	Winchester	6	4	3	3	-3
Lynnfield	5	1	6	1	1	Winthrop	249	92	324	160	75
Malden	11	7	16	2	5	Woburn	1	1	5	2	4
Manchester	1	1	0	0	-1	**TOTAL**	2,964	585	3,955	730	991

Source: Massport NAO.

Flight Track Monitoring Report

Introduction

As part of its ongoing commitment to mitigate noise at Logan Airport, Massport has undertaken evaluating the flight tracks of turbojet aircraft engaged in the implementation of established FAA noise abatement procedures. As is true for any airport operator, however, Massport has no authority to control where individual aircraft actually fly. That remains the responsibility of the Federal Aviation Administration (FAA), while the individual pilots are responsible for safely executing the FAA's instructions. The flight procedures, which are used by the Air Traffic Control (ATC) staff at Boston Tower to achieve desired noise abatement tracks, are contained in the FAA's Tower Order BOS TWR 7040.1.

This is the fifth annual report for Flight track monitoring; prior to 2002 Massport had issued semi-annual reports, an outgrowth of the Flight Track Monitoring Program study. That study was contained in the Generic Environmental Impact Report filed with MEPA in July of 1996, and was the subject of two Community Working Group (CWG) workshops in September and October of 1996. The time period covered by this report is January 1 through December 31, 2006. Massport's consultants prepared the work.

The purpose of the ongoing monitoring program is to identify any systematic changes in flight tracks that may occur and to reduce flight track dispersion, where appropriate. The next report will cover the period January 1, 2007 through December 31, 2007, and will be included in the *2007 EDR*.

FAA Air Traffic Control Procedures

FAA Tower Order BOS TWR 7040.1 entitled "Noise Abatement" describes the series of noise abatement policies, rules, regulations, and the procedures to be followed by the FAA air traffic controllers in meeting their designated responsibilities to be "a good neighbor and to meet ... operational objectives within the context of mitigating noise whenever circumstances permit." Section 8(e) of the Order, subtitled "Turbojet Departure and Arrival Noise Abatement Procedures" lists the specific procedures that apply to each major departure runway. They are paraphrased below.

Note in the descriptions that follow that terms such as "BOS 2 DME" are used frequently. Here, BOS refers to an aid to navigation known as the BOSTON VORTAC, a radio beacon physically located on the Airport near the eastern shoreline between the ends of Runways 27 and 33L. DME refers to "Distance Measuring Equipment," a co-located aid to navigation that provides pilots with a cockpit display of the number of nautical miles that the aircraft is from the designated radio beacon. Thus, BOS 2 DME means an aircraft should be 2 nautical miles away from the BOSTON VORTAC. The term "vectored" means the pilot is assigned to fly a magnetic heading given by and at the discretion of the FAA air traffic controller in order to maintain the safe separation of aircraft. "MSL" means feet above mean sea level--the indicator of aircraft altitude used both by the pilot in the cockpit and the air traffic controller on the ground.

- For departures from Runway 4R, the noise abatement procedure in the Tower Order is: Fly runway heading until the BOS 4 DME, then a heading of 090 degrees until clear of Nahant, then southbound. The departure may be vectored westbound to pass north of Hull and above 6,000 MSL by Deer Island. Otherwise, the departures shall be vectored south to cross the shoreline westbound, south of the Hull peninsula, in the vicinity of the 10-mile range mark above 6,000 MSL. Traffic that is vectored northbound shall cross the shoreline at or above 6,000 MSL in the vicinity of Marblehead Harbor.

- For Runway 9, the procedure is: Fly runway heading until at least the BOS 2 DME before turning. The westbound traffic shall be south of the Hull peninsula in the vicinity of the 10-mile range mark and cross the shoreline above 6,000 MSL. Traffic that is vectored northbound must cross the shoreline at or above 6,000 MSL in the vicinity of Marblehead Harbor.

- For Runway 15R, the procedure is: Fly runway heading to the BOS 1 DME then turn left to 120 degrees. North and south shoreline crossings shall be the same as for Runway 9 [that is, at or above 6,000 MSL].

- For Runway 22R: Turn left to a heading of 140 degrees; upon radar identification, Departure Control [an FAA air traffic control position] will continue the turn east to pass north of the Hull peninsula. The north and south shoreline crossings shall be the same as for Runway 9. [Departures from Runway 22L, occurring far less often than those from Runway 22R, follow this same procedure although the Tower Order does not specify instructions for Runway 22L per se].

- For Runway 27:
  - Logan TWO SID: Fly heading 275 until BOS 2.2 DME, then turn left heading 235 degrees until BOS 6 DME, then on course.
  - WYLLY RNAV (for turbojet aircraft only). Fly heading 273 and turn to 235 over the GARVE waypoint. Stay on this course until over the WYLLY waypoint. This procedure keeps most jet traffic in a well defined flight corridor.

- For Runway 33L: Maintain runway heading to the BOS 2 DME, then turn left heading 315 degrees until leaving 3,000 feet [MSL] or reaching the BOS 5 DME.

These brief procedural statements form the basis of the verbal instructions and flight clearances that are passed from controller to pilot in order to achieve reduced noise in the communities surrounding Logan while also maintaining the safe and efficient flow of aircraft in and out of the Airport. However, the consistency with which these procedures can be implemented varies due to air traffic demands, controller workloads, weather conditions, and other operational factors, as noted in the Flight Track Monitoring Program Study.

Statistical Analyses of Flight Tracks - Runway 4R

The Nahant Gate (Figure 1) monitors aircraft after the first turn at 4 DME. The Swampscott and Marblehead Gates monitor northbound shoreline crossings, while the Hull 2, Hull 3, and Cohasset Gates monitor southbound shoreline crossings.

Figure 1 **Logan Airport Gates**

Tables 1 and 2 show the results of the analyses. Table 1 shows the dispersion of the jet departures on Runway 4R as they pass through the Nahant Gate. Table 2 shows that Runway 4R departures were concentrated, with 92.0 percent "over the Causeway," and about 0.6 percent in the south end of the gate. Table 1 shows how many of the shoreline crossings from Runway 4R were above 6,000 feet. Approximately 54.7 percent of departures were above 6,000 feet at Swampscott.

Table 1 Runways 4R/4L Nahant Gate Summary for 2006

	Number of Tracks Through Gate Segment	Total Number of Tracks Through Gate	Percentage of Tracks Through Gate Segment
North End of Gate	506	6,876	7.4%
Over Causeway	6,328	6,876	92.0%
South End of Gate	42	6,876	0.6%
Total	6,876	6,876	100.0%

Table 2 Runways 4R/4L Shoreline Crossings Above 6,000 Feet for 2006

	Number of Tracks Through Gate	Number Above 6000 Feet	Percentage Above 6000 Feet
Swampscott Gate	770	421	54.7%
Marblehead Gate	1,418	1,399	98.7%
Hull 2 Gate	1,144	572	50.0%
Hull 3 Gate	837	834	99.6%
Cohasset Gate	412	206	50.0%
Total	4,581	3,432	74.9%

Statistical Analyses of Flight Tracks - Runway 9

The Winthrop 1 and Winthrop 2 gates (Figure 1) monitor early turns for Departures off Runway 9. The Revere, Swampscott, or Marblehead gates monitor northbound shoreline crossings, while the Hull 2, Hull 3, or Cohasset gates monitor southbound shoreline crossings.

Tables 3 and 4 show the results of the analyses. Table 3 shows how many tracks turned prior to the BOS 2 DME. Northbound turns before BOS 2 DME pass through the Winthrop 1 Gate. Southbound traffic would pass through the Winthrop 2 Gate. In 2006, there were a total of 99 such turns, or about 0.2 percent. Table 4 indicates that 97.9 percent of Runway 9 departures were above 6,000 feet when crossing the shoreline, as compared with 97.5 percent in 2005.

Table 3 Runway 9 Gate Summary - Winthrop Gates 1 and 2 for 2006

	Number of Departure Tracks	Number of Tracks Through Gate	Percent Turning Before BOS 2 DME
Winthrop 1 Gate	52,839	42	0.1%
Winthrop 2 Gate	52,839	99	0.2%
Total	52,839	141	0.3%

Table 4 Runway 9 Shoreline Crossings Above 6,000 Feet for 2006

	Number of Tracks Through Gate	Number Above 6000 Feet	Percentage Above 6000 Feet
Revere Gate	112	78	69.6%
Swampscott Gate	5,037	4,823	95.8%
Marblehead Gate	6,890	6,836	99.2%
Hull 2 Gate	6,764	6,627	98.0%
Hull 3 Gate	23,093	22,558	97.7%
Cohasset Gate	4,264	4,250	99.7%
Total	46,160	45,172	97.9%

Statistical Analyses of Flight Tracks - Runway 15R

After takeoff, Runway 15R departures turn left approximately 30 degrees to avoid Hull, head out over Boston Harbor, and return back over the shore through the Swampscott and Marblehead Gates (Figure 1) to the north, or through the Hull 2, Hull 3, and Cohasset Gates to the south.

Table 5 shows the results of the analysis. Table 5 shows that 96.2 percent of all Runway 15R departures crossed the shoreline above 6,000 feet.

Table 5 Runway 15R Shoreline Crossings Above 6,000 Feet for 2006

	Number of Tracks Through Gate	Number Above 6000 Feet	Percentage Above 6000 Feet
Swampscott Gate	545	537	98.5%
Marblehead Gate	372	369	99.2%
Hull 2 Gate	406	389	95.8%
Hull 3 Gate	1,656	1,562	94.3%
Cohasset Gate	293	291	99.3%
Total	3,272	3,148	96.2%

Statistical Analyses of Flight Tracks - Runways 22R/22L

The Squantum 2 and Hull 1 Gates (Figure 1) are used to monitor the turn to 140 degrees over Boston Harbor and north of Hull. The shoreline gates are used to monitor shoreline crossings, as for Runways 4R, 9, and 15R above.

Tables 6, 7, and 8 show the results of the analyses. Table 6 shows the dispersion of the jet departures from Runways 22R-22L as they pass through the Squantum 2 Gate. Table 7 shows that 96.4 percent of the tracks were north of the Hull peninsula as they passed through the Hull 1 Gate. Table 8 shows that 98.4 percent of the shoreline crossings from Runways 22R-22L were above 6,000 feet in 2006.

Table 6 Runways 22R/22L Squantum 2 Gate Summary for 2006

	Number of Tracks Through Gate Segment	Total Number of Tracks Through Gate	Percentage of Tracks Through Gate Segment
0 - 12,000 ft	39,017	55,017	70.9%
12,000 - 14,000 ft	10,812	55,017	19.7%
14,000 - 21,000 ft	5,098	55,017	9.3%
21,000 - 27,000 ft	90	55,017	0.2%
Total	55,017	55,017	100.0%

Table 7 Runways 15R/22R/22L Gate Summary - North of Hull Peninsula for 2006

	Number of Tracks Through Gate	Number of Tracks North of Hull Peninsula	Percentage of Tracks North of Hull Peninsula
Hull 1 Gate	66,397	64,039	96.4%

Table 8	Runways 22R/22L Shoreline Crossings Above 6,000 Feet for 2006		
	Number of Tracks Through Gate	Number Above 6000 Feet	Percentage Above 6000 Feet
Revere Gate	1,497	1,484	99.1%
Swampscott Gate	10,241	10,221	99.8%
Marblehead Gate	3,983	3,966	99.6%
Hull 2 Gate	3,863	3,733	96.6%
Hull 3 Gate	31,485	30,781	97.8%
Cohasset Gate	5,234	5,224	99.8%
Total	56,303	55,409	98.4%

Runway 27

On September 15, 1996, the FAA implemented a new departure procedure for Runway 27 called the WYLYY RNAV procedure. In accordance with the provisions of the Record of Decision issued for the Runway 27 EIS, Massport has been providing on-going radar flight track data and analysis to the FAA with respect to the new procedure. Table 9 presents the results for the Runway 27 corridor complied for 2006. The average percentage of tracks through the corridor was 54.6 percent.

Table 9 Runway 27 Corridor Percent of Tracks Through Each Gate for 2006

Month	Total # of Tracks	Total # of Tracks Through All Gates	Percent of Tracks Through All Gates	Gate A 1,400 ft[1]	Gate B 2,200 ft[1]	Gate C 2,900 ft[1]	Gate D 4,700 ft[1]	Gate E 6,300 ft[1]	Average Percent Through Each Gate
January	1,814	893	49.2%	59.4%	70.4%	83.5%	92.6%	89.7%	79.1%
February	1,926	999	51.9%	64.5%	74.0%	85.6%	92.3%	86.7%	80.6%
March	3,823	2,010	52.6%	63.6%	72.4%	86.0%	94.0%	90.1%	81.2%
April	1,620	852	52.6%	71.5%	85.2%	92.5%	89.4%	28.0%	73.3%
May	1,118	634	56.7%	65.6%	75.0%	87.9%	94.0%	91.0%	82.7%
June	1,489	822	55.2%	63.3%	72.4%	85.0%	92.3%	89.4%	80.5%
July	950	546	57.5%	64.0%	75.6%	87.3%	92.8%	89.9%	81.9%
August	853	495	58.0%	65.2%	74.3%	88.5%	95.7%	92.8%	83.3%
September	1,187	710	59.8%	74.7%	88.5%	93.3%	92.1%	25.9%	74.9%
October	2,997	1,624	54.2%	64.8%	74.9%	86.3%	92.8%	89.4%	81.6%
November	1,704	906	53.2%	61.4%	71.0%	83.2%	90.4%	87.6%	78.7%
December	1,166	631	54.1%	63.8%	72.6%	84.1%	90.4%	87.1%	79.6%
Average	**1,721**	**927**	**54.6%**	**65.2%**	**75.5%**	**86.9%**	**92.4%**	**79.0%**	**79.8%**

1 Width of Each Gate in Feet.

Statistical Analyses of Flight Tracks - Runway 33L

The Somerville and Everett Gates (Figure 1) extend from BOS 2 DME to BOS 5 DME and are used to monitor the departure procedure for Runway 33L. Turns to the left prior to the BOS 5 DME would pass through the Somerville Gate. Turns to the right prior to the BOS 5 DME would pass through the Everett Gate. Table 10 shows the results of the analyses. The table indicates that 6.8 percent of tracks turned prior to either achieving 3,000 feet or reaching the BOS 5 DME. In 2005, 6.6 percent of tracks turned early before reaching 3,000 feet.

Table 10 Runway 33L Gates - Passages Below 3,000 Feet for 2006

	Number of Departure Tracks	Number of Tracks Turning Before BOS 5 DME Below 3,000 ft	Percentage of Tracks Turning Before BOS 5 DME Below 3,000 ft
Everett Gate	10,112	368	3.6%
Somerville Gate	10,112	321	3.2%
Total	10,112	689	6.8%

I

Air Quality/Emissions Reduction

This appendix provides the following detailed information and tables in support of *Chapter 7, Air Quality/ Emissions Reduction*:

- 2006 Aircraft Fleet and Operational Data used in EDMS Version 5.0.1
  - Table I-1 2006 Fleet Mix, Annual Landing-and-Takeoff Cycles (LTOs), and Taxi/Idle Time-in-Mode by Aircraft Type

- Ground Service Equipment/Alternative Fuels Conversion
  - Table I-2 Ground Service Equipment Alternative Fuel Conversion Summary (kg/day)

Motor Vehicle Emissions
  - Table I-3 MOBILE6.2.03 Input Files
  - Table I-4 MOBILE6.2.03 Output Files

- Fuel Storage and Handling
  - Table I-5 Fuel Throughput by Fuel Category (gallons)

- Stationary Sources
  - Table I-6 Stationary Source Fuel Throughput by Fuel Category (gallons)

- Letter sent by Massport in August 2006 encouraging airlines to use single-engine taxiing[1]

1 Any emission reductions due to single engine taxiing have not been accounted for in this analysis.

2006 Aircraft Fleet and Operational Data used in EDMS Version 5.0.1

The Federal Aviation Administration (FAA) Emissions Dispersion System (EDMS), is the United States (US) Environmental Protection Agency (EPA)-preferred and the FAA-required model for conducting airport air quality analyses. The most recent version of EDMS, Version 5.0.1 (EDMSv5.0.1), was used in support of the *2006 Environmental Data Report (2006 EDR)* Air Quality Analysis. Table I-1 contains the data that was used in EDMSv5.0.1 to represent actual conditions at Logan Airport in 2006. This data includes aircraft type, engine, landing takeoff cycles (LTOs) and taxi times. The aircraft have been divided into four categories: air carrier, cargo, commuter, and general aviation.

Table I-1 2006 Fleet Mix, Annual Landing-and-Takeoff Cycles (LTOs), and Taxi/Idle Time-in-Mode by Aircraft Type

Aircraft Type	Engine	LTOs	Description (Airline)	Taxi Times
Air Carrier Aircraft				
Airbus A300B4-600 Series	CF6-80C2A5 1862M39	3	AC AAL	25.32
Airbus A310-200 Series	CF6-80A3	167	AC SATA	25.32
Airbus A319-100 Series	CFM56-5A4	271	AC ACA	25.32
Airbus A319-100 Series	V2522-A5	468	AC AWE	25.32
Airbus A319-100 Series	V2524-A5	23	AC Independence Air	25.32
Airbus A319-100 Series	CFM56-5B6/P	700	AC NWA	25.32
Airbus A319-100 Series	CFM56-5B6/P	342	AC Spirit	25.32
Airbus A319-100 Series	V2524-A5	66	AC TACA	25.32
Airbus A319-100 Series	CFM56-5B6/P	1	AC Twin Jet	25.32
Airbus A319-100 Series	V2522-A5	2,061	AC UAL	25.32
Airbus A319-100 Series	CFM56-5B6/P	13,464	AC USA	25.32
Airbus A320-100 Series	V2527-A5	1	AC Kuwait Airways	25.32
Airbus A320-200 Series	CFM56-5-A1	88	AC ACA	25.32
Airbus A320-200 Series	V2527-A5	1,584	AC AWE	25.32
Airbus A320-200 Series	V2527-A5	8,741	AC JBU	25.32
Airbus A320-200 Series	CFM56-5-A1	1,358	AC NWA	25.32
Airbus A320-200 Series	V2527-A5	58	AC TACA	25.32
Airbus A320-200 Series	V2527-A5	1,372	AC UAL	25.32
Airbus A320-200 Series	CFM56-5B4/P	749	AC USA	25.32
Airbus A321-100 Series	CFM56-5B3/P	6	AC ACA	25.32
Airbus A321-100 Series	CFM56-5B3/P	251	AC USA	25.32
Airbus A330-200 Series	CF6-80E1A3 Standard	7	AC AFR	25.32
Airbus A330-200 Series	CF6-80E1A2 1862M39	160	AC EIN	25.32
Airbus A330-200 Series	PW4168A Talon II	43	AC NWA	25.32
Airbus A330-200 Series	PW4168 Talon II	337	AC SWR	25.32
Airbus A330-300 Series	PW4168A Talon II	23	AC DLH	25.32
Airbus A330-300 Series	CF6-80E1A4 Standard	342	AC EIN	25.32
Airbus A330-300 Series	PW4168A Talon II	335	AC NWA	25.32
Airbus A330-300 Series	PW4168A Talon II	1	AC USA	25.32
Airbus A340-300 Series	CFM56-5C2	533	AC AFR	25.32
Airbus A340-300 Series	CFM56-5C4/P SAC	574	AC DLH	25.32
Airbus A340-300 Series	CFM56-5C4/P SAC	17	AC SWR	25.32
Airbus A340-300 Series	CFM56-5C4/P SAC	50	AC VIR	25.32
Airbus A340-600 Series	Trent 556-61 Phase 5 tiled	3	AC DLH	25.32
Airbus A340-600 Series	Trent 556-61 Phase 5 tiled	95	AC VIR	25.32
Boeing 717-200 Series	BR700-715A1-30	2,094	AC MEP	25.32
Boeing 717-200 Series	BR700-715A1-30	8,431	AC TRS	25.32
Boeing 727-200 Series	JT8D-15 Reduced emissions	6	AC Boston-Maine Airways	25.32
Boeing 727-200 Series	JT8D-15 Reduced emissions	29	AC CCP (Champion Air)	25.32
Boeing 727-200 Series	JT8D-15 Reduced emissions	50	AC Miami Air	25.32
Boeing 737-200 Series	JT8D-15A	29	AC Cayman Airways	25.32
Boeing 737-200 Series	JT8D-15A	303	AC DAL	25.32
Boeing 737-200 Series	JT8D-9 Reduced emissions	5	AC Pace	25.32

Table I-1 2006 Fleet Mix, Annual Landing-and-Takeoff Cycles (LTOs), and Taxi/Idle Time-in-Mode by Aircraft Type (Continued)

Aircraft Type	Engine	LTOs	Description (Airline)	Taxi Times
Air Carrier Aircraft (cont'd.)				
Boeing 737-200 Series	JT8D-15A	55	AC RYN	25.32
Boeing 737-200 Series	JT8D-15A	12	AC Sky King	25.32
Boeing 737-300 Series	CFM56-3-B1	1,920	AC COA	25.32
Boeing 737-300 Series	CFM56-3-B1	6	AC Pace	25.32
Boeing 737-300 Series	CFM56-3-B1	2	AC SWA	25.32
Boeing 737-300 Series	CFM56-3-B1	1,582	AC UAL	25.32
Boeing 737-300 Series	CFM56-3B-2	1,949	AC USA	25.32
Boeing 737-400 Series	CFM56-3B-2	3	AC Miami Air	25.32
Boeing 737-400 Series	CFM56-3B-2	1,114	AC USA	25.32
Boeing 737-400 Series	CFM56-3B-2	97	AC Xtra Airways	25.32
Boeing 737-500 Series	CFM56-3C-1	3,866	AC COA	25.32
Boeing 737-500 Series	CFM56-3C-1	416	AC UAL	25.32
Boeing 737-700 Series	CFM56-7B22	104	AC AMX (Aeromexico)	25.32
Boeing 737-700 Series	CFM56-7B24	3	AC ASA	25.32
Boeing 737-700 Series	CFM56-7B24	923	AC COA	25.32
Boeing 737-700 Series	CFM56-7B22	1,449	AC TRS	25.32
Boeing 737-800 Series	CFM56-7B26	34	AC AAL	25.32
Boeing 737-800 Series	CFM56-7B26	257	AC ASA	25.32
Boeing 737-800 Series	CFM56-7B26	262	AC COA	25.32
Boeing 737-800 Series	CFM56-7B26	2,619	AC DAL	25.32
Boeing 737-900 Series	CFM56-7B26	289	AC ASA	25.32
Boeing 737-900 Series	CFM56-7B27	8	AC COA	25.32
Boeing 747-200 Series	JT9D-7Q	1	AC JAL	25.32
Boeing 747-400 Series	CF6-80C2B1F 1862M39	61	AC AFR	25.32
Boeing 747-400 Series	CF6-80C2B1F 1862M39	1	AC Air India	25.32
Boeing 747-400 Series	RB211-524H	506	AC BAW	25.32
Boeing 747-400 Series	CF6-80C2B1F 1862M39	1	AC Cathay Pacific	25.32
Boeing 747-400 Series	CF6-80C2B1F 1862M39	162	AC DLH	25.32
Boeing 747-400 Series	PW4056 Reduced emissions	1	AC Qantas	25.32
Boeing 747-400 Series	PW4056 Reduced emissions	1	AC UAL	25.32
Boeing 747-400 Series	CF6-80C2B1F 1862M39	218	AC VIR	25.32
Boeing 757-200 Series	RB211-535E4B Phase 5	6,590	AC AAL	25.32
Boeing 757-200 Series	RB211-535E4	2	AC AMT	25.32
Boeing 757-200 Series	RB211-535E4	58	AC AWE	25.32
Boeing 757-200 Series	RB211-535E4	6	AC COA	25.32
Boeing 757-200 Series	PW2037	5,188	AC DAL	25.32
Boeing 757-200 Series	PW2037	6	AC EIN	25.32
Boeing 757-200 Series	PW2037	25	AC FIN	25.32
Boeing 757-200 Series	RB211-535E4	409	AC ICE	25.32
Boeing 757-200 Series	PW2037	4	AC Miami Air	25.32
Boeing 757-200 Series	RB211-535E4	30	AC NAO	25.32
Boeing 757-200 Series	PW2037	1,716	AC NWA	25.32
Boeing 757-200 Series	PW2037	1	AC Pace	25.32
Boeing 757-200 Series	RB211-535E4	66	AC RYN	25.32
Boeing 757-200 Series	PW2037	1	AC Titan Airways	25.32

Table I-1 2006 Fleet Mix, Annual Landing-and-Takeoff Cycles (LTOs), and Taxi/Idle Time-in-Mode by Aircraft Type (Continued)

Aircraft Type	Engine	LTOs	Description (Airline)	Taxi Times
Air Carrier Aircraft (Cont'd.)				
Boeing 757-200 Series	PW2037	5,025	AC UAL	25.32
Boeing 757-200 Series	RB211-535E4	1,536	AC USA	25.32
Boeing 757-300 Series	RB211-535E4B Phase 5	1	AC COA	25.32
Boeing 757-300 Series	RB211-535E4B Phase 5	20	AC ICE	25.32
Boeing 757-300 Series	RB211-535E4B Phase 5	240	AC NWA	25.32
Boeing 767-200 Series	CF6-80A1	13	AC AAL	25.32
Boeing 767-200 Series	CF6-80A2	8	AC DAL	25.32
Boeing 767-200 Series	CF6-80C2B2 1862M39	20	AC USA	25.32
Boeing 767-300 ER	PW4060 Reduced emissions	1	AC AMX (Aeromexico)	25.32
Boeing 767-300 ER	PW4060 Reduced emissions	193	AC DAL	25.32
Boeing 767-300 ER	PW4060 Reduced emissions	45	AC ICE	25.32
Boeing 767-300 Series	CF6-80C2B6 1862M39	215	AC AAL	25.32
Boeing 767-300 Series	CF6-80A2	1	AC Aeroflot	25.32
Boeing 767-300 Series	CF6-80C2B6 1862M39	404	AC AZA	25.32
Boeing 767-300 Series	CF6-80A2	3	AC EIN	25.32
Boeing 767-300 Series	CF6-80A2	155	AC NAO	25.32
Boeing 767-300 Series	PW4060 Reduced emissions	116	AC UAL	25.32
Boeing 777-200 Series	Trent 892	733	AC AAL	25.32
Boeing 777-200 Series	GE90-92B DAC I	2	AC AFR	25.32
Boeing 777-200 Series	GE90-85B DAC II	589	AC BAW	25.32
Boeing 777-200 Series	Trent 892	3	AC DAL	25.32
Boeing 777-200 Series	PW4077	3	AC UAL	25.32
Boeing DC-10-10 Series	CF6-6K	3	AC Omni Air	25.32
Boeing DC-10-40 Series	JT9D-20	4	AC NWA	25.32
Boeing DC-9-30 Series	JT8D-9 Reduced emissions	94	AC NWA	25.32
Boeing DC-9-30 Series	JT8D-7 Reduced emissions	3	AC USA Jet Airlines	25.32
Boeing DC-9-40 Series	JT8D-11	38	AC NWA	25.32
Boeing DC-9-50 Series	JT8D-17 Reduced emissions	165	AC NWA	25.32
Boeing MD-11	PW4460 Reduced smoke	2	AC Saudi Arabian	25.32
Boeing MD-11	CF6-80C2D1F 1862M39	1	AC WOA	25.32
Boeing MD-81	JT8D-217C Environmental Kit	48	AC MEP	25.32
Boeing MD-82	JT8D-217 Environmental Kit	3,904	AC AAL	25.32
Boeing MD-83	JT8D-219 Environmental Kit	3,235	AC AAL	25.32
Boeing MD-88	JT8D-219 Environmental Kit	8,051	AC DAL	25.32
Boeing MD-88	JT8D-219 Environmental Kit	1	AC MEP	25.32
Bombardier CRJ-100	CF34-3A1 LEC II	42	AC ACA	25.32
Bombardier CRJ-100	CF34-3A1 LEC II	14,248	AC COM	25.32
Bombardier CRJ-700	CF34-8C1	190	AC COM	25.32
Bombardier Learjet 24	CJ610-6	2	AC Ameristar Charters	25.32
Dassault Falcon 20-C	CF700-2D	4	AC USA Jet Airlines	25.32
Embraer ERJ170	CF34-8E5A1 LEC	1,562	AC ACA	25.32
Embraer ERJ170	CF34-8E5A1 LEC	7,533	AC JBU	25.32
Gulfstream G400	TAY Mk611-8	3	AC Saudi Arabian	25.32
Lockheed L-1011 Tristar	RB211-22B Package 1	4	AC AMT	25.32
Total Air Carrier Aircraft LTOs		**125,728**		

Table I-1 2006 Fleet Mix, Annual Landing-and-Takeoff Cycles (LTOs), and Taxi/Idle Time-in-Mode by Aircraft Type (Continued)

Aircraft Type	Engine	LTOs	Description (Airline)	Taxi Times
Cargo Aircraft				
Airbus A300B4-600 Series	PW4158 Reduced smoke	5	Cargo UPS	25.32
Boeing 727-100 Series	JT8D-7 Reduced emissions	135	Cargo FDX	25.32
Boeing 727-100 Series	TAY 651 Transply	18	Cargo UPS	25.32
Boeing 727-200 Series	JT8D-15 Reduced emissions	573	Cargo Astar	25.32
Boeing 727-200 Series	JT8D-15 Reduced emissions	204	Cargo Capital Cargo Int'l	25.32
Boeing 727-200 Series	JT8D-9 Reduced emissions	156	Cargo Custom Air Transport	25.32
Boeing 727-200 Series	JT8D-15 Reduced emissions	11	Cargo Express.Net	25.32
Boeing 727-200 Series	JT8D-15 Reduced emissions	1,191	Cargo FDX	25.32
Boeing 727-200 Series	JT8D-9 Reduced emissions	24	Cargo KHA	25.32
Boeing 737-300 Series	CFM56-3-B1	252	Cargo KHA	25.32
Boeing 747-200 Series	JT9D-7Q	1	Cargo Polar	25.32
Boeing 747-400 Series	CF6-80C2B1F 1862M39	36	Cargo Cargolux	25.32
Boeing 757-200 Series	PW2040	631	Cargo UPS	25.32
Boeing DC-10-10 Series	CF6-6D	19	Cargo FDX	25.32
Boeing DC-8 Series 60	JT3D-3B	4	Cargo ABX	25.32
Boeing DC-8 Series 70	CFM56-2A series	23	Cargo UPS	25.32
Boeing MD-11	CF6-80C2D1F 1862M39	926	Cargo FDX	25.32
Raytheon Beech 1900-C	PT6A-67D	249	Cargo Skylink Aviation	25.32
Total Cargo Aircraft LTOs		**4,458**		
Commuter Aircraft				
Bombardier Challenger 604	CF34-3B	1,956	Comm FLG (Pinnacle)	25.32
Bombardier Challenger 604	CF34-3B	89	Comm PSA Airlines	25.32
Bombardier Challenger 604	CF34-3B	664	Comm US Airways Express	25.32
Bombardier CRJ-100	CF34-3B	612	Comm ASH	25.32
Bombardier CRJ-100	CF34-3B	3,423	Comm JZA	25.32
Bombardier CRJ-700	CF34-8C1	341	Comm ASH	25.32
Bombardier CRJ-700	CF34-8C1	34	Comm PSA Airlines	25.32
Bombardier CRJ-900	CF34-8C5 LEC	2	Comm ASH	25.32
Bombardier CRJ-900	CF34-8C5 LEC	147	Comm JZA	25.32
Bombardier de Havilland Dash 8 Q100	PW120A	257	Comm JZA	25.32
Bombardier de Havilland Dash 8 Q100	PW120A	1,306	Comm Piedmont Airlines	25.32
Bombardier de Havilland Dash 8 Q200	PW123D	128	Comm Piedmont Airlines	25.32
Bombardier de Havilland Dash 8 Q300	PW123	15	Comm JZA	25.32
Bombardier de Havilland Dash 8 Q300	PW123	1	Comm Piedmont Airlines	25.32
Cessna 337 Skymaster	TSIO-360C	13,639	Comm KAP	25.32
Cessna 550 Citation II	JT15D-4 series	1	Comm JZA	25.32
Embraer ERJ140	AE3007A1/3	745	Comm Chautauqua	25.32
Embraer ERJ140	AE3007A1/3	16,831	Comm EGF	25.32
Embraer ERJ145	AE3007A1E Type 3	955	Comm ASH	25.32
Embraer ERJ145	AE3007A1E Type 3	4,673	Comm Chautauqua	25.32
Embraer ERJ145	AE3007A1E Type 3	138	Comm EGF	25.32
Embraer ERJ145	AE3007A1E Type 3	305	Comm LOF	25.32
Embraer ERJ170	CF34-8E5A1 LEC	130	Comm Republic Airlines	25.32
Embraer ERJ170	CF34-8E5A1 LEC	66	Comm US Airways Express	25.32
Raytheon Beech 1900-C	PT6A-65B	5,180	Comm CJC	25.32

Table I-1 2006 Fleet Mix, Annual Landing-and-Takeoff Cycles (LTOs), and Taxi/Idle Time-in-Mode by Aircraft Type (Continued)

Aircraft Type	Engine	LTOs	Description (Airline)	Taxi Times
Commuter Aircraft (Cont'd)				
Raytheon Beech 1900-C	PT6A-67D	4,149	Comm UCA	25.32
Saab 340-A	CT7-5	1	Comm EGF	25.32
Saab 340-B-Plus	CT7-5	1,364	Comm CJC	25.32
Total Commuter Aircraft LTOs		**57,152**		
General Aviation Aircraft				
Airbus A310-200 Series	CF6-80A3	1	GA	25.32
Airbus A340-300 Series	CFM56-5C4/P SAC	4	GA	25.32
Antonov 74 Coaler	D-36	1	GA	25.32
BAC 1-11 200	SPEY Mk511 Transply IIH	1	GA	25.32
BAE Jetstream 31	TPE331-10	5	GA	25.32
Bell 206 JetRanger	250B17B	36	GA	7.00
Boeing 707-300 Series	JT3D-3B	2	GA	25.32
Boeing 727-200 Series	JT8D-15 Reduced emissions	11	GA	25.32
Boeing 737-200 Series	JT8D-15A	6	GA	25.32
Boeing 737-300 Series	CFM56-3-B1	2	GA	25.32
Boeing 737-400 Series	CFM56-3B-2	1	GA	25.32
Boeing 737-700 Series	CFM56-7B22	18	GA	25.32
Boeing 737-800 Series	CFM56-7B26	2	GA	25.32
Boeing 767-200 Series	CF6-80C2B2 1862M39	4	GA	25.32
Boeing 767-300 Series	CF6-80A2	5	GA	25.32
Boeing DC-8 Series 60	JT3D-3B	1	GA	25.32
Boeing DC-8 Series 70	CFM56-2A series	7	GA	25.32
Boeing DC-9-30 Series	JT8D-7 Reduced emissions	2	GA	25.32
Bombardier Challenger 600	ALF 502L-2	486	GA	25.32
Bombardier Challenger 600	ALF 502L-2	59	GA Bombardier Business Jet	25.32
Bombardier Challenger 600	ALF 502L-2	6	GA Executive Jet Management	25.32
Bombardier Challenger 600	ALF 502L-2	12	GA Flight Options	25.32
Bombardier Challenger 600	ALF 502L-2	38	GA TAG Aviation	25.32
Bombardier Challenger 604	CF34-3B	96	GA	25.32
Bombardier Challenger 604	CF34-3B	116	GA Bombardier Business Jet	25.32
Bombardier Challenger 604	CF34-3B	1	GA TAG Aviation	25.32
Bombardier CRJ-100	CF34-3B	1	GA	25.32
Bombardier CRJ-100	CF34-3B	2	GA TAG Aviation	25.32
Bombardier Global Express	BR700-710A1-10	108	GA	25.32
Bombardier Global Express	BR700-710A1-10	4	GA TAG Aviation	25.32
Bombardier Learjet 24	CJ610-6	10	GA	25.32
Bombardier Learjet 25	CJ610-6	11	GA	25.32
Bombardier Learjet 31	TFE731-2-2B	137	GA	25.32
Bombardier Learjet 35	TFE731-2-2B	753	GA	25.32
Bombardier Learjet 35	TFE731-2-2B	395	GA Airnet Systems	25.32
Bombardier Learjet 35	TFE731-2-2B	196	GA Bombardier Business Jet	25.32
Bombardier Learjet 35	TFE731-2-2B	34	GA Executive Jet Management	25.32
Cessna 150 Series	O-200	1	GA	25.32
Cessna 150 Series	O-200	1	GA Angel Flight	25.32
Cessna 172 Skyhawk	TSIO-360C	102	GA	25.32

Table I-1 2006 Fleet Mix, Annual Landing-and-Takeoff Cycles (LTOs), and Taxi/Idle Time-in-Mode by Aircraft Type (Continued)

Aircraft Type	Engine	LTOs	Description (Airline)	Taxi Times
General Aviation Aircraft (Cont'd)				
Cessna 172 Skyhawk	TSIO-360C	74	GA Angel Flight America	25.32
Cessna 208 Caravan	PT6A-114	107	GA	25.32
Cessna 208 Caravan	PT6A-114	165	GA Airnet Systems	25.32
Cessna 208 Caravan	PT6A-114	2	GA Angel Flight America	25.32
Cessna 337 Skymaster	TSIO-360C	120	GA	25.32
Cessna 337 Skymaster	TSIO-360C	6	GA Angel Flight America	25.32
Cessna 441 Conquest II	TPE331-8	20	GA	25.32
Cessna 500 Citation I	JT15D-1 series	122	GA	25.32
Cessna 500 Citation I	JT15D-1 series	186	GA Citation Shares LLC	25.32
Cessna 500 Citation I	JT15D-1 series	22	GA Flight Options	25.32
Cessna 550 Citation II	JT15D-4 series	425	GA	25.32
Cessna 550 Citation II	JT15D-4 series	212	GA Citation Shares LLC	25.32
Cessna 560 Citation V	JT15D-5, -5A, -5B	554	GA	25.32
Cessna 560 Citation V	JT15D-5, -5A, -5B	127	GA Citation Shares LLC	25.32
Cessna 560 Citation V	JT15D-5, -5A, -5B	26	GA Executive Jet Management	25.32
Cessna 560 Citation V	JT15D-5, -5A, -5B	7	GA Flight Options	25.32
Cessna 560 Citation V	JT15D-5, -5A, -5B	1,395	GA Netjets Aviation	25.32
Cessna 560 Citation V	JT15D-5, -5A, -5B	7	GA TAG Aviation	25.32
Cessna 650 Citation III	TFE731-3	346	GA	25.32
Cessna 650 Citation III	TFE731-3	32	GA Citation Shares	25.32
Cessna 650 Citation III	TFE731-3	11	GA Executive Jet Management	25.32
Cessna 650 Citation III	TFE731-3	24	GA Flight Options	25.32
Cessna 650 Citation III	TFE731-3	97	GA Netjets Aviation	25.32
Cessna 650 Citation III	TFE731-3	1	GA TAG Aviation	25.32
Cessna 750 Citation X	AE3007C Type 1	208	GA	25.32
Cessna 750 Citation X	AE3007C Type 1	13	GA Executive Jet Management	25.32
Cessna 750 Citation X	AE3007C Type 1	26	GA Flight Options	25.32
Cessna 750 Citation X	AE3007C Type 1	495	GA Netjets Aviation	25.32
Cessna 750 Citation X	AE3007C Type 1	1	GA TAG Aviation	25.32
Convair CV-640	RDA10	3	GA	25.32
Dassault Falcon 100	TFE731-3	60	GA	25.32
Dassault Falcon 2000-EX	PW308C Annular	291	GA	25.32
Dassault Falcon 2000-EX	PW308C Annular	1	GA Executive Jet Management	25.32
Dassault Falcon 2000-EX	PW308C Annular	210	GA Netjets Aviation	25.32
Dassault Falcon 2000-EX	PW308C Annular	8	GA TAG Aviation	25.32
Dassault Falcon 20-C	CF700-2D	56	GA	25.32
Dassault Falcon 20-C	CF700-2D	2	GA TAG Aviation	25.32
Dassault Falcon 50	TFE731-3	573	GA	25.32
Dassault Falcon 50	TFE731-3	4	GA Executive Jet Management	25.32
Dassault Falcon 50	TFE731-3	15	GA TAG Aviation	25.32
Dornier 328 Jet	PW306B Annular	4	GA	25.32
EADS Socata TB-10 Tobago	IO-360-B	4	GA	25.32
EADS Socata TB-10 Tobago	IO-360-B	3	GA Angel Flight	25.32
Embraer EMB120 Brasilia	PW118	1	GA	25.32
Embraer ERJ140	AE3007A1/3	31	GA	25.32
Embraer ERJ140	AE3007A1/3	32	GA Flight Options	25.32
Fairchild SA-226-T Merlin III	TPE331-3	20	GA	25.32

Table I-1 2006 Fleet Mix, Annual Landing-and-Takeoff Cycles (LTOs), and Taxi/Idle Time-in-Mode by Aircraft Type (Continued)

Aircraft Type	Engine	LTOs	Description (Airline)	Taxi Times
General Aviation Aircraft (Cont'd.)				
Gulfstream G200	PW306A Annular	58	GA	25.32
Gulfstream G200	PW306A Annular	16	GA Executive Jet Management	25.32
Gulfstream G200	PW306A Annular	131	GA Netjets Aviation	25.32
Gulfstream G200	PW306A Annular	3	GA TAG Aviation	25.32
Gulfstream G300	SPEY MK511-8	208	GA	25.32
Gulfstream G300	SPEY MK511-8	1	GA TAG Aviation	25.32
Gulfstream G400	TAY Mk611-8	799	GA	25.32
Gulfstream G400	TAY Mk611-8	30	GA Executive Jet Management	25.32
Gulfstream G400	TAY Mk611-8	1	GA Flight Options	25.32
Gulfstream G400	TAY Mk611-8	16	GA TAG Aviation	25.32
Gulfstream G500	BR700-710A1-10	251	GA	25.32
Gulfstream G500	BR700-710A1-10	11	GA TAG Aviation	25.32
Gulfstream II	SPEY MK511-8	93	GA	25.32
Israel IAI-1124-A Westwind II	TFE731-3	82	GA	25.32
Lockheed L-1329 Jetstar I	TFE731-3	2	GA	25.32
Mitsubishi MU-300 Diamond	JT15D-4 series	17	GA	25.32
Pilatus PC-6 Porter	PT6A-42	382	GA	25.32
Pilatus PC-6 Porter	PT6A-42	6	GA Angel Flight America	25.32
Pilatus PC-6 Porter	PT6A-42	1	GA TAG Aviation	25.32
Piper PA-23 Apache/Aztec	TIO-540-J2B2	48	GA	25.32
Piper PA-23 Apache/Aztec	TIO-540-J2B2	4	GA Angel Flight America	25.32
Piper PA-24 Comanche	TIO-540-J2B2	43	GA	25.32
Piper PA-24 Comanche	TIO-540-J2B2	61	GA Angel Flight America	25.32
Piper PA-28 Cherokee Series	O-320	55	GA	25.32
Piper PA-28 Cherokee Series	O-320	60	GA Angel Flight America	25.32
Piper PA-31 Navajo	TIO-540-J2B2	377	GA	25.32
Piper PA-31 Navajo	TIO-540-J2B2	718	GA Airnet Systems	25.32
Piper PA-31 Navajo	TIO-540-J2B2	68	GA Angel Flight America	25.32
Piper PA-31T Cheyenne	PT6A-28	33	GA	25.32
Piper PA-31T Cheyenne	PT6A-28	1	GA Angel Flight America	25.32
Piper PA-32 Cherokee Six	TIO-540-J2B2	58	GA	25.32
Piper PA-32 Cherokee Six	TIO-540-J2B2	33	GA Angle Flight America	25.32
Piper PA-42 Cheyenne Series	PT6A-41	59	GA	25.32
Raytheon Beech 1900-C	PT6A-67D	91	GA	25.32
Raytheon Beechjet 400	JT15D-5, -5A, -5B	377	GA	25.32
Raytheon Beechjet 400	JT15D-5, -5A, -5B	341	GA Flight Options	25.32
Raytheon Beechjet 400	JT15D-5, -5A, -5B	107	GA Netjets Aviation	25.32
Raytheon Hawker 1000	TFE731-3	889	GA	25.32
Raytheon Hawker 1000	TFE731-3	15	GA Executive Jet Management	25.32
Raytheon Hawker 1000	TFE731-3	224	GA Flight Options	25.32
Raytheon Hawker 1000	TFE731-3	324	GA Netjets Aviation	25.32
Raytheon Hawker 1000	TFE731-3	26	GA TAG Aviation	25.32
Raytheon Hawker 4000 Horizon	PW308A Annular	1	GA	25.32
Raytheon King Air 100	PT6A-28	51	GA	25.32
Raytheon King Air 90	PT6A-28	99	GA	25.32
Raytheon King Air 90	PT6A-28	2	GA Angel Flight	25.32
Raytheon Super King Air 200	PT6A-41	196	GA	25.32

Table I-1 2006 Fleet Mix, Annual Landing-and-Takeoff Cycles (LTOs), and Taxi/Idle Time-in-Mode by Aircraft Type (Continued)

Aircraft Type	Engine	LTOs	Description (Airline)	Taxi Times
General Aviation Aircraft (Cont'd.)				
Raytheon Super King Air 200	PT6A-41	3	GA Flight Options	25.32
Raytheon Super King Air 300	PT6A-60	175	GA	25.32
Raytheon Super King Air 300	PT6A-60	51	GA	25.32
Rockwell Commander 700	IO-360-B	108	GA	25.32
Rockwell Commander 700	IO-360-B	70	GA Angel Flight America	25.32
Rockwell Sabreliner 80	CF700-2D	18	GA	25.32
Tupolev 154 Careless	D-30KU-154	1	GA	25.32
Total General Aviation Aircraft LTOs		**15,722**		
Total Fleet LTOs		**203,060**		

Notes: Due to rounding of the operations (1 LTO = 2 Operations) there may be some differences (+/-) between the values reported here and those reported in *Chapter 2, Activity Levels*.
Aircraft taxi times are based on Logan Airport data obtained from the FAA Aviation System Performance Metrics (ASPM) database for 2006.

Ground Service Equipment/Alternative Fuels Conversion

For the 2006 analyses, ground service equipment (GSE) emissions were calculated using EDMS emission factors which are based on the U.S. EPA NONROAD2005 model in combination with the 2001 Alternative Fuel Vehicle (AFV) Survey for Logan Airport and the 2004 GSE time-in-mode survey. In this way, the most up-to-date GSE fleet operational, conversion and emissions characteristics are used.

Table I-2 Ground Service Equipment Alternative Fuel Conversion Summary (kg/day)

Year	Pollutant	Percent Reduction	Calculated Emissions without Reduction	Reduction from AFVs	Calculated Emissions with Reduction
2000[1]	Volatile Organic Compounds (VOCs)	13.72%	178	24	154
	Oxides of Nitrogen (NO_x)	9.87%	369	36	333
	Carbon Monoxide (CO)	12.88%	6,124	789	5,335
2001[1]	VOCs	13.72%	166	23	143
	NO_x	9.87%	338	33	305
	CO	12.88%	5,960	768	5,193
2002[2]	VOCs	13.6%	286	39	247
	NO_x	8.0%	350	28	322
	CO	16.3%	6,174	1,004	5,170
2003[2]	VOCs	13.8%	263	36	227
	NO_x	8.0%	316	25	291
	CO	16.4%	5,692	934	4,758

Table I-2 Ground Service Equipment Alternative Fuel Conversion Summary (kg/day) (Continued)

Year	Pollutant	Percent Reduction	Calculated Emissions without Reduction	Reduction from AFVs	Calculated Emissions with Reduction
2004[3]	VOCs	11.9%	212	25	187
	NO_x	6.6%	357	24	333
	CO	15.4%	4,236	650	3,586
2005[4]	VOCs	12.2%	203	25	178
	NO_x	6.9%	335	23	312
	CO	15.4%	4,175	643	3,531
	$PM_{10}/PM_{2.5}$	9.9%	11	1	10
2006[5]	VOCs	10.7%	86	9	77
	NO_x	7.5%	324	24	300
	CO	13.8%	1,841	255	1,586
	$PM_{10}/PM_{2.5}$	10.8%	10	1	9

1 2000 and 2001 analyses used EDMSv4.03.
2 2002 and 2003 analyses used EDMSv4.11, which used updated emission factors from the NONROAD2002 Model.
3 2004 analyses used EDMSv4.21, which again used emission factors from the EPA NONROAD2002 Model.
4 2005 analysis used EDMSv4.5, which used emission factors from the EPA NONROAD2002 Model.
5 2006 analysis used EDMSv5.0.1, which used emission factors from the EPA NONROAD2005 Model.

Motor Vehicle Emissions

The same methods that were previously used in the *2005 Environmental Data Report (2005 EDR)* were also employed to calculate motor vehicle emissions in this *2006 EDR*.

In the *2006 EDR*, the resultant emission factors were multiplied by average daily vehicle miles to calculate daily emissions. The on-airport traffic data are summarized in the vehicle miles traveled (VMT) analyses tables of *Appendix G, Ground Transportation*. Due to the new roadway configuration of the Ted Williams Tunnel, through-traffic no longer traverses through airport property. Therefore, emissions from these vehicles are no longer included as part of the airport emissions inventory beginning in 2003. Furthermore, MOBILE6 was used to obtain vehicle emissions at idle to estimate parking and curbside motor vehicle emissions.[2] Idling emissions are determined for a unit of time and multiplied by total idling time to reach the associated emissions. The input and output files of MOBILE6.2.03 are included as Tables I-3 and I-4.

2 Idle emissions factors in grams per hour are determined by multiplying the emissions factors at 2.5 miles per hour by 2.5, in accordance with EPA guidance (*MOBILE6 Refers to Mobile5 User Information Sheet #5* EPA, July 30, 1993).

Table I-3 MOBILE6.2.03 Input Files

```
* Calendar Year 2006 Generic MOBILE6 input file for Mesoscale Build/No-Build Analyses
* Filename MA05_MES.INP created on 10/7/05 by Craig Woleader, MADEP 617-348-4046, craig.woleader@state.ma.us
* revised 12/2/05 to include actual diesel rebuild effects
* Edited by Wayne Arner, KB Environmental Sciences, 4/17/07, for specific speeds, to obtain emission factors for: VOC, CO, and NOx
*
***************    Header Section    ***************
MOBILE6 INPUT FILE
*
POLLUTANTS         : HC CO NOX CO2
DATABASE OUTPUT    :
WITH FIELDNAMES    :
AGGREGATED OUTPUT  :
EMISSIONS TABLE    : MA06_MES.tb1 REPLACE
REPORT FILE        : MA06_MES.txt REPLACE
*
RUN DATA
***************    Run Section #1    ***************
> *** Summer 2006 ***

* Pollutant output format
EXPRESS HC AS VOC  :
EXPAND BUS EFS     :

* Mass. specific user inputs -- require external data file
REG DIST           : 2005_REG.D
I/M DESC FILE      : MA_IM06.D

* Set Diesel Rebuild effects to 10% as per EPA
REBUILD EFFECTS    : 0.10

ANTI-TAMP PROG     :
00 84 50 11111 12222222 2 12 096. 22112122

STAGE II REFUELING :
91 3 84. 84.

* Inputs for LEV II
94+ LDG IMP        : MA_LEV2.D
T2 EXH PHASE-IN    : LEV2EXH.D
T2 EVAP PHASE-IN   : LEV2EVAP.D
T2 CERT            : LEV2CERT.D

* Meteorological inputs
MIN/MAX TEMP       : 68. 94.

* Fuel inputs
FUEL RVP           : 6.8
FUEL PROGRAM       : 2 N
```

Table I-3 MOBILE6.2.03 Input Files

```
DIESEL FRACTIONS  :
0.000 0.000 0.000 0.003 0.003 0.002 0.002 0.002 0.002 0.001
0.001 0.001 0.000 0.001 0.001 0.003 0.001 0.002 0.000 0.015
0.009 0.056 0.070 0.119 0.136
0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.000 0.001
0.001 0.001 0.001 0.001 0.001 0.002 0.002 0.003 0.003 0.006
0.013 0.017 0.019 0.020 0.064
0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.000 0.001
0.001 0.001 0.001 0.001 0.001 0.002 0.002 0.003 0.003 0.006
0.013 0.017 0.019 0.020 0.064
0.005 0.005 0.005 0.005 0.005 0.005 0.005 0.006 0.005 0.012
0.012 0.017 0.015 0.014 0.016 0.017 0.014 0.018 0.016 0.021
0.048 0.065 0.060 0.066 0.101
0.005 0.005 0.005 0.005 0.005 0.005 0.005 0.006 0.005 0.012
0.012 0.017 0.015 0.014 0.016 0.017 0.014 0.018 0.016 0.021
0.048 0.065 0.060 0.066 0.101
0.176 0.176 0.176 0.170 0.207 0.202 0.206 0.243 0.176 0.285
0.267 0.212 0.255 0.295 0.249 0.251 0.188 0.175 0.182 0.186
0.219 0.184 0.170 0.143 0.140
0.385 0.385 0.385 0.407 0.433 0.467 0.464 0.480 0.375 0.472
0.480 0.366 0.400 0.344 0.285 0.333 0.314 0.253 0.208 0.197
0.168 0.130 0.106 0.114 0.087
0.674 0.674 0.674 0.634 0.664 0.719 0.717 0.744 0.715 0.565
0.810 0.803 0.644 0.654 0.605 0.525 0.389 0.356 0.376 0.108
0.136 0.154 0.148 0.120 0.000
0.830 0.830 0.830 0.845 0.860 0.840 0.819 0.813 0.610 0.686
0.570 0.733 0.607 0.729 0.685 0.725 0.631 0.350 0.305 0.186
0.209 0.343 0.091 0.175 0.200
0.884 0.884 0.884 0.840 0.887 0.931 0.917 0.914 0.923 0.901
0.908 0.898 0.903 0.876 0.804 0.844 0.782 0.702 0.679 0.554
0.529 0.568 0.628 0.571 0.583
0.977 0.977 0.977 0.972 0.953 0.993 0.992 0.992 0.990 0.981
0.976 0.975 0.959 0.982 0.965 0.963 0.945 0.902 0.875 0.857
0.791 0.796 0.846 0.805 0.879
0.972 0.972 0.972 0.955 0.984 0.995 0.992 0.991 0.995 0.993
0.993 0.995 0.992 0.986 0.995 0.981 0.993 0.971 0.982 0.977
0.993 0.987 0.986 0.988 0.967
1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000
1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000 1.000
1.000 1.000 1.000 1.000 1.000
0.786 0.786 0.786 0.917 0.884 0.925 0.968 0.961 0.972 0.985
0.971 0.941 0.905 0.965 0.940 0.907 0.964 0.609 0.880 1.000
0.778 0.500 1.000 0.000 0.000

***************  Scenario Section  ***************

SCENARIO RECORD  : 2006 DEFAULT SPEED - Summer
```

Table I-3 MOBILE6.2.03 Input Files

CALENDAR YEAR : 2006
EVALUATION MONTH : 7

SCENARIO RECORD : 2006 Idle Scenario - Summer (multiply g/mi by 2.5 mph to get g/hr)
CALENDAR YEAR : 2006
EVALUATION MONTH : 7
AVERAGE SPEED : 2.5 Arterial 0.0 100.0 0.0 0.0

SCENARIO RECORD : 2006 Arterial Scenario 15 mph - Summer
CALENDAR YEAR : 2006
EVALUATION MONTH : 7
AVERAGE SPEED : 15 Arterial 0.0 100.0 0.0 0.0

SCENARIO RECORD : 2006 Arterial Scenario 20 mph - Summer
CALENDAR YEAR : 2006
EVALUATION MONTH : 7
AVERAGE SPEED : 20 Arterial 0.0 100.0 0.0 0.0

SCENARIO RECORD : 2006 Arterial Scenario 25 mph - Summer
CALENDAR YEAR : 2006
EVALUATION MONTH : 7
AVERAGE SPEED : 25 Arterial 0.0 100.0 0.0 0.0

SCENARIO RECORD : 2006 Arterial Scenario 30 mph - Summer
CALENDAR YEAR : 2006
EVALUATION MONTH : 7
AVERAGE SPEED : 30 Arterial 0.0 100.0 0.0 0.0

SCENARIO RECORD : 2006 Arterial Scenario 35 mph - Summer
CALENDAR YEAR : 2006
EVALUATION MONTH : 7
AVERAGE SPEED : 35 Arterial 0.0 100.0 0.0 0.0

SCENARIO RECORD : 2006 Arterial Scenario 50 mph - Summer
CALENDAR YEAR : 2006
EVALUATION MONTH : 7
AVERAGE SPEED : 50 Arterial 0.0 100.0 0.0 0.0

*************** End of This Run ***************
END OF RUN

* Calendar Year 2006 Generic MOBILE6 input file for Mesoscale Build/No-Build Analyses, Ozone, CO, and PM
* Filename MA06PM03.INP created on 6/2/06 by Craig Woleader, MADEP 617-348-4046, craig.woleader@state.ma.us

Table I-3 MOBILE6.2.03 Input Files

```
* Edited by Wayne Arner, KB Environmental Sciences, 4/17/07, for specific speeds, to obtain PM emission factors
*
***************    Header Section    ***************
MOBILE6 INPUT FILE
*
PARTICULATES       :
POLLUTANTS         : HC CO NOX CO2
DATABASE OUTPUT    :
WITH FIELDNAMES    :
AGGREGATED OUTPUT  :
EMISSIONS TABLE    : MA06PM03.tb1 REPLACE
REPORT FILE        : MA06PM03.txt REPLACE
*
RUN DATA
***************    Run Section #1    ***************
> *** Summer 2006 ***

* Pollutant output format
EXPRESS HC AS VOC  :
EXPAND BUS EFS     :

* Mass. specific user inputs -- require external data file
REG DIST           : 2005_REG.D
I/M DESC FILE      : MA_IM06.D

ANTI-TAMP PROG     :
00 84 50 11111 12222222 2 12 096. 22112122

* Set Diesel Rebuild effects to 10% as per EPA
REBUILD EFFECTS    : 0.10

STAGE II REFUELING :
91 3 84. 84.

* Inputs for LEV II
94+ LDG IMP        : MA_LEV2.D
T2 EXH PHASE-IN    : LEV2EXH.D
T2 EVAP PHASE-IN   : LEV2EVAP.D
T2 CERT            : LEV2CERT.D

* Meteorological inputs
MIN/MAX TEMP       : 68. 94.

* Fuel inputs
FUEL RVP           : 6.8
FUEL PROGRAM       : 2 N

DIESEL FRACTIONS   :
```

Table I-3 MOBILE6.2.03 Input Files

```
0.000  0.000  0.000  0.003  0.003  0.002  0.002  0.002  0.002  0.001
0.001  0.001  0.000  0.001  0.001  0.003  0.001  0.002  0.000  0.015
0.009  0.056  0.070  0.119  0.136
0.001  0.001  0.001  0.001  0.001  0.001  0.001  0.001  0.000  0.001
0.001  0.001  0.001  0.001  0.001  0.002  0.002  0.003  0.003  0.006
0.013  0.017  0.019  0.020  0.064
0.001  0.001  0.001  0.001  0.001  0.001  0.001  0.001  0.000  0.001
0.001  0.001  0.001  0.001  0.001  0.002  0.002  0.003  0.003  0.006
0.013  0.017  0.019  0.020  0.064
0.005  0.005  0.005  0.005  0.005  0.005  0.005  0.006  0.005  0.012
0.012  0.017  0.015  0.014  0.016  0.017  0.014  0.018  0.016  0.021
0.048  0.065  0.060  0.066  0.101
0.005  0.005  0.005  0.005  0.005  0.005  0.005  0.006  0.005  0.012
0.012  0.017  0.015  0.014  0.016  0.017  0.014  0.018  0.016  0.021
0.048  0.065  0.060  0.066  0.101
0.176  0.176  0.176  0.170  0.207  0.202  0.206  0.243  0.176  0.285
0.267  0.212  0.255  0.295  0.249  0.251  0.188  0.175  0.182  0.186
0.219  0.184  0.170  0.143  0.140
0.385  0.385  0.385  0.407  0.433  0.467  0.464  0.480  0.375  0.472
0.480  0.366  0.400  0.344  0.285  0.333  0.314  0.253  0.208  0.197
0.168  0.130  0.106  0.114  0.087
0.674  0.674  0.674  0.634  0.664  0.719  0.717  0.744  0.715  0.565
0.810  0.803  0.644  0.654  0.605  0.525  0.389  0.356  0.376  0.108
0.136  0.154  0.148  0.120  0.000
0.830  0.830  0.830  0.845  0.860  0.840  0.819  0.813  0.610  0.686
0.570  0.733  0.607  0.729  0.685  0.725  0.631  0.350  0.305  0.186
0.209  0.343  0.091  0.175  0.200
0.884  0.884  0.884  0.840  0.887  0.931  0.917  0.914  0.923  0.901
0.908  0.898  0.903  0.876  0.804  0.844  0.782  0.702  0.679  0.554
0.529  0.568  0.628  0.571  0.583
0.977  0.977  0.977  0.972  0.953  0.993  0.992  0.992  0.990  0.981
0.976  0.975  0.959  0.982  0.965  0.963  0.945  0.902  0.875  0.857
0.791  0.796  0.846  0.805  0.879
0.972  0.972  0.972  0.955  0.984  0.995  0.992  0.991  0.995  0.993
0.993  0.995  0.992  0.986  0.995  0.981  0.993  0.971  0.982  0.977
0.993  0.987  0.986  0.988  0.967
1.000  1.000  1.000  1.000  1.000  1.000  1.000  1.000  1.000  1.000
1.000  1.000  1.000  1.000  1.000  1.000  1.000  1.000  1.000  1.000
1.000  1.000  1.000  1.000  1.000
0.786  0.786  0.786  0.917  0.884  0.925  0.968  0.961  0.972  0.985
0.971  0.941  0.905  0.965  0.940  0.907  0.964  0.609  0.880  1.000
0.778  0.500  1.000  0.000  0.000

***************   Scenario Section   ***************

SCENARIO RECORD   : PM 10 - Idle Scenario - Summer (multiply g/mi by 2.5 mph to get g/hr)
CALENDAR YEAR     : 2006
EVALUATION MONTH  : 7
```

Table I-3 MOBILE6.2.03 Input Files

```
PARTICULATE EF    : PMGZML.CSV  PMGDR1.CSV  PMGDR2.CSV  PMDZML.CSV  PMDDR1.CSV  PMDDR2.CSV
PARTICLE SIZE     : 10
DIESEL SULFUR     : 350
AVERAGE SPEED     : 2.5 Arterial 0.0 100.0 0.0 0.0

SCENARIO RECORD   : PM 10 - Summer 15 mph
CALENDAR YEAR     : 2006
EVALUATION MONTH  : 7
PARTICULATE EF    : PMGZML.CSV  PMGDR1.CSV  PMGDR2.CSV  PMDZML.CSV  PMDDR1.CSV  PMDDR2.CSV
PARTICLE SIZE     : 10
DIESEL SULFUR     : 350
AVERAGE SPEED     : 15 Arterial 0.0 100.0 0.0 0.0

SCENARIO RECORD   : PM 10 - Summer 20 mph
CALENDAR YEAR     : 2006
EVALUATION MONTH  : 7
PARTICULATE EF    : PMGZML.CSV  PMGDR1.CSV  PMGDR2.CSV  PMDZML.CSV  PMDDR1.CSV  PMDDR2.CSV
PARTICLE SIZE     : 10
DIESEL SULFUR     : 350
AVERAGE SPEED     : 20 Arterial 0.0 100.0 0.0 0.0

SCENARIO RECORD   : PM 10 - Summer 25 mph
CALENDAR YEAR     : 2006
EVALUATION MONTH  : 7
PARTICULATE EF    : PMGZML.CSV  PMGDR1.CSV  PMGDR2.CSV  PMDZML.CSV  PMDDR1.CSV  PMDDR2.CSV
PARTICLE SIZE     : 10
DIESEL SULFUR     : 350
AVERAGE SPEED     : 25 Arterial 0.0 100.0 0.0 0.0

SCENARIO RECORD   : PM 10 - Summer 30 mph
CALENDAR YEAR     : 2006
EVALUATION MONTH  : 7
PARTICULATE EF    : PMGZML.CSV  PMGDR1.CSV  PMGDR2.CSV  PMDZML.CSV  PMDDR1.CSV  PMDDR2.CSV
PARTICLE SIZE     : 10
DIESEL SULFUR     : 350
AVERAGE SPEED     : 30 Arterial 0.0 100.0 0.0 0.0

SCENARIO RECORD   : PM 10 - Summer 35 mph
CALENDAR YEAR     : 2006
EVALUATION MONTH  : 7
PARTICULATE EF    : PMGZML.CSV  PMGDR1.CSV  PMGDR2.CSV  PMDZML.CSV  PMDDR1.CSV  PMDDR2.CSV
PARTICLE SIZE     : 10
DIESEL SULFUR     : 350
AVERAGE SPEED     : 35 Arterial 0.0 100.0 0.0 0.0

SCENARIO RECORD   : PM 10 - Summer 50 mph
CALENDAR YEAR     : 2006
EVALUATION MONTH  : 7
```

Table I-3 MOBILE6.2.03 Input Files

```
PARTICULATE EF     : PMGZML.CSV  PMGDR1.CSV  PMGDR2.CSV  PMDZML.CSV  PMDDR1.CSV  PMDDR2.CSV
PARTICLE SIZE      : 10
DIESEL SULFUR      : 350
AVERAGE SPEED      : 50 Arterial 0.0 100.0 0.0 0.0

***************     End of This Run     ***************
END OF RUN
```

Table I-4 MOBILE6.2.03 Output Files

```
*****************************************************************************
* MOBILE6.2.03 (24-Sep-2003)                                               *
* Input file: MA06_MES.INP (file 1, run 1).                                *
*****************************************************************************
* *** Summer 2006 ***

* Reading Registration Distributions from the following external
* data file: 2005_REG.D
 M 49 Warning:
          1.00    MYR sum not = 1. (will normalize)
 M 49 Warning:
         0.998    MYR sum not = 1. (will normalize)
 M 49 Warning:
         0.998    MYR sum not = 1. (will normalize)
 M 49 Warning:
         0.998    MYR sum not = 1. (will normalize)
 M 49 Warning:
          1.00    MYR sum not = 1. (will normalize)
 M 49 Warning:
          1.00    MYR sum not = 1. (will normalize)
 M 49 Warning:
         0.999    MYR sum not = 1. (will normalize)
 M 49 Warning:
         0.998    MYR sum not = 1. (will normalize)
 M 49 Warning:
          1.00    MYR sum not = 1. (will normalize)
 M 49 Warning:
         0.999    MYR sum not = 1. (will normalize)
 M 49 Warning:
          1.00    MYR sum not = 1. (will normalize)
 M 49 Warning:
          1.00    MYR sum not = 1. (will normalize)
 M 49 Warning:
          1.00    MYR sum not = 1. (will normalize)
 M 49 Warning:
          1.00    MYR sum not = 1. (will normalize)

* Reading I/M program description records from the following external
* data file: MA_IM06.D
* I/M program inputs for 2006 calendar year model run
* MA31 Exhaust I/M program for Light Duty pre-1996 MY vehicles <=10,0000 lb GVWR

* Reading non-default I/M CUTPOINTS from the following external
* data file: MA06_CUT.D
* Two-Speed Idle Exhaust I/M program for Heavy Duty vehicles >10,000 lb GVWR
* OBD Exhaust I/M program for Light Duty MY 1996+ vehicles <=10,000 lb GVWR
* Gas Cap Evap I/M program thru CY 2003 for all Light Duty vehicles <=8,500 lb GVWR
```

Table I-4 MOBILE6.2.03 Output Files

```
* Gas Cap Evap I/M program for all MY Heavy Duty vehicles >8,500 lb GVWR
* OBD + Gas Cap Evap I/M program for MY 1996 - 2003 Light Duty vehicles <=8,500 lb GVWR starting 2004
* OBD Evap I/M program for MY 2004+
 M601 Comment:
        User has enabled STAGE II REFUELING.


* Reading 94+ LEV IMPLEMENTATION SCHEDULE from the following external
* data file: MA_LEV2.D

 Reading User Supplied Tier2 Exhaust bin phase-in fractions

   Data read from file: LEV2EXH.D


 Reading User Supplied Tier2 EVAP phase-in fractions

   Data read from file: LEV2EVAP.D


 Reading User Supplied Tier2 50K certification standards

   Data read from file: LEV2CERT.D

 M616 Comment:
        User has supplied post-1999 sulfur levels.
 M614 Comment:
        User supplied diesel sale fractions.

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 2006 DEFAULT SPEED - Summer
* File 1, Run 1, Scenario 1.
* # # # # # # # # # # # # # # # # # # # # # # # # #
*** I/M credits for Tech1&2 vehicles were read from the following external
   data file: TECH12.D
 M 48 Warning:
        there are no sales for vehicle class HDGV8b
 HDDV DEFEAT DEVICE EFFECTS ARE PRESENT. THE REBUILD FRACTION IS 0.10.

 LEV phase-in data read from file MA_LEV2.D
              Calendar Year:  2006
                     Month:  July
                  Altitude:  Low
        Minimum Temperature:  68.0 (F)
        Maximum Temperature:  94.0 (F)
          Absolute Humidity:   75. grains/lb
        Fuel Sulfur Content:   30. ppm
```

Table I-4 MOBILE6.2.03 Output Files

```
            Exhaust I/M Program:  Yes
              Evap I/M Program:  Yes
                  ATP Program:  Yes
              Reformulated Gas:  Yes

     Vehicle Type:     LDGV   LDGT12   LDGT34    LDGT     HDGV    LDDV     LDDT     HDDV      MC   All Veh
          GVWR:              <6000    >6000    (All)
                  ------  ------  ------  ------  ------  ------  ------  ------  ------  ------
  VMT Distribution:   0.3793   0.3529   0.1387           0.0362   0.0009   0.0015   0.0865   0.0041   1.0000
 Fuel Economy (mpg):     24.1     18.6     14.3     17.2      9.9     29.7     18.3      7.2     50.0     16.6
 ---------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
   Composite VOC :    0.700    0.541    0.635    0.568    0.727    0.551    0.539    0.496     3.99    0.631
   Composite CO  :     6.91     6.96     8.22     7.31     8.12    1.631    0.979    2.739    17.09    6.819
   Composite NOX :    0.601    0.675    1.023    0.773    3.195    1.175    0.982   11.113     1.27    1.693
   Composite CO2 :    368.6    476.3    620.8    517.0    898.0    342.3    555.6   1405.9    177.4   549.95
 ---------------------------------------------------------------------------------------------------------------
        Veh. Type:   GasBUS    URBAN   SCHOOL
                     ------   ------   ------
          VMT Mix:   0.0002   0.0009   0.0017
 Fuel Economy (mpg):     6.4      4.3      6.2
---------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
   Composite VOC :    0.667    0.387    0.613
   Composite CO  :     9.16    3.865    2.019
   Composite NOX :    4.143   15.883   11.009
   Composite CO2 :   1377.0   2353.6   1646.1
---------------------------------------------------------------------------------------------------------------


* # # # # # # # # # # # # # # # # # # # # # # # # #
* 2006 Idle Scenario - Summer (multiply g/mi by 2.5 mph to get g/hr)
* File 1, Run 1, Scenario 2.
* # # # # # # # # # # # # # # # # # # # # # # # # #
 M583 Warning:
         The user supplied arterial average speed of  2.5
         will be used for all hours of the day.  100% of VMT
         has been assigned to the arterial/collector roadway
         type for all hours of the day and all vehicle types.
 M 48 Warning:
           there are no sales for vehicle class HDGV8b

 LEV phase-in data read from file MA_LEV2.D
                  Calendar Year:  2006
                          Month:  July
                       Altitude:  Low
            Minimum Temperature:  68.0 (F)
            Maximum Temperature:  94.0 (F)
              Absolute Humidity:   75. grains/lb
```

Table I-4 MOBILE6.2.03 Output Files

```
          Fuel Sulfur Content:  30. ppm

          Exhaust I/M Program:  Yes
            Evap I/M Program:  Yes
               ATP Program:  Yes
            Reformulated Gas:  Yes

      Vehicle Type:     LDGV   LDGT12   LDGT34    LDGT    HDGV    LDDV    LDDT    HDDV      MC   All Veh
          GVWR:              <6000    >6000    (All)
                  ------  ------  ------  ------  ------  ------  ------  ------  ------  ------
   VMT Distribution:   0.3793   0.3529   0.1387           0.0362   0.0009   0.0015   0.0865   0.0041   1.0000
 Fuel Economy (mpg):     24.1     18.6     14.3     17.2      9.9     29.7     18.3      7.2     50.0     16.6
 ----------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
   Composite VOC :    5.489    3.779    3.851    3.799    5.361    1.183    1.266    1.535    12.79    4.331
   Composite CO  :    19.80    16.63    20.49    17.72    37.63    4.493    2.943   12.149   119.90   19.132
   Composite NOX :    1.346    1.326    1.987    1.512    2.338    1.884    1.587   16.818     1.12    2.802
   Composite CO2 :    368.6    476.2    620.7    517.0    897.9    342.3    555.6   1405.8    177.4   549.90
 ----------------------------------------------------------------------------------------------------------
       Veh. Type:   GasBUS    URBAN   SCHOOL
                  ------  ------  ------
         VMT Mix:   0.0002   0.0009   0.0017
 Fuel Economy (mpg):      6.4      4.3      6.2
----------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
   Composite VOC :    4.313    1.197    1.899
   Composite CO  :    42.48   17.142    8.956
   Composite NOX :    3.031   26.295   18.218
   Composite CO2 :   1376.9   2353.4   1646.0
----------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 2006 Arterial Scenario 15 mph - Summer
* File 1, Run 1, Scenario 3.
* # # # # # # # # # # # # # # # # # # # # # # # # #
 M583 Warning:
         The user supplied arterial average speed of 15.0
         will be used for all hours of the day.  100% of VMT
         has been assigned to the arterial/collector roadway
         type for all hours of the day and all vehicle types.
 M 48 Warning:
          there are no sales for vehicle class HDGV8b

 LEV phase-in data read from file MA_LEV2.D
             Calendar Year:  2006
                    Month:  July
                  Altitude:  Low
          Minimum Temperature:  68.0 (F)
```

Table I-4 MOBILE6.2.03 Output Files

```
          Maximum Temperature:  94.0 (F)
           Absolute Humidity:   75. grains/lb
          Fuel Sulfur Content:   30. ppm

          Exhaust I/M Program:  Yes
             Evap I/M Program:  Yes
                 ATP Program:  Yes
            Reformulated Gas:  Yes

     Vehicle Type:     LDGV   LDGT12  LDGT34    LDGT    HDGV    LDDV    LDDT    HDDV      MC  All Veh
          GVWR:               <6000   >6000    (All)
                  ------  ------  ------  ------  ------  ------  ------  ------  ------  ------
  VMT Distribution:   0.3793   0.3529   0.1387           0.0362   0.0009   0.0015   0.0865   0.0041   1.0000
 Fuel Economy (mpg):    24.1     18.6     14.3     17.2      9.9     29.7     18.3      7.2     50.0     16.6
 -------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
   Composite VOC :    0.868    0.672    0.796    0.707    1.194   0.766    0.787    0.850     4.81    0.815
   Composite CO  :    6.84     6.67     8.00     7.05    14.06    2.299    1.437    4.935    25.21    7.102
   Composite NOX :    0.741    0.793    1.197    0.907    2.641   1.233    1.031   11.153     1.01    1.794
   Composite CO2 :   368.6    476.2    620.7    517.0    897.9   342.3    555.6   1405.8    177.4   549.90
 -------------------------------------------------------------------------------
       Veh. Type:   GasBUS    URBAN   SCHOOL
                  ------  ------  ------
        VMT Mix:   0.0002   0.0009   0.0017
 Fuel Economy (mpg):    6.4      4.3      6.2
--------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
   Composite VOC :    1.091    0.662    1.051
   Composite CO  :   15.87     6.963    3.638
   Composite NOX :    3.425   16.715   11.585
   Composite CO2 :  1376.9   2353.4   1646.0
--------------------------------------------------------------------------------


* # # # # # # # # # # # # # # # # # # # # # # # # #
* 2006 Arterial Scenario 20 mph - Summer
* File 1, Run 1, Scenario 4.
* # # # # # # # # # # # # # # # # # # # # # # # # #
 M583 Warning:
        The user supplied arterial average speed of 20.0
        will be used for all hours of the day.  100% of VMT
        has been assigned to the arterial/collector roadway
        type for all hours of the day and all vehicle types.
 M 48 Warning:
          there are no sales for vehicle class HDGV8b

 LEV phase-in data read from file MA_LEV2.D
              Calendar Year:  2006
                     Month:  July
```

Table I-4 MOBILE6.2.03 Output Files

```
                Altitude:  Low
     Minimum Temperature:  68.0 (F)
     Maximum Temperature:  94.0 (F)
       Absolute Humidity:   75. grains/lb
     Fuel Sulfur Content:   30. ppm

     Exhaust I/M Program:  Yes
        Evap I/M Program:  Yes
             ATP Program:  Yes
        Reformulated Gas:  Yes

   Vehicle Type:    LDGV   LDGT12   LDGT34    LDGT    HDGV    LDDV    LDDT    HDDV      MC   All Veh
          GVWR:              <6000    >6000    (All)
                  ------  ------  ------  ------  ------  ------  ------  ------  ------  ------
 VMT Distribution:  0.3793   0.3529   0.1387          0.0362   0.0009   0.0015   0.0865   0.0041   1.0000
Fuel Economy (mpg):    24.1     18.6     14.3    17.2      9.9     29.7     18.3      7.2     50.0     16.6
 ---------------------------------------------------------------------------------------------------
Composite Emission Factors (g/mi):
   Composite VOC :    0.759    0.584    0.692    0.614    0.938   0.673    0.680    0.697     4.34    0.703
   Composite CO  :    6.31     6.26     7.48     6.60    10.44    1.932    1.185    3.727    20.06    6.426
   Composite NOX :    0.663    0.722    1.095    0.827    2.763   1.106    0.922   10.048     1.06    1.634
   Composite CO2 :   368.6    476.2    620.7    517.0    897.9   342.3    555.6   1405.8    177.4   549.90
 ---------------------------------------------------------------------------------------------------
      Veh. Type:   GasBUS    URBAN   SCHOOL
                  ------  ------  ------
        VMT Mix:   0.0002   0.0009   0.0017
Fuel Economy (mpg):      6.4      4.3      6.2
----------------------------------------------------------------------------------------------------
Composite Emission Factors (g/mi):
   Composite VOC :    0.861    0.543    0.862
   Composite CO  :   11.79     5.258    2.747
   Composite NOX :    3.583   14.845   10.291
   Composite CO2 :  1376.9   2353.4   1646.0
----------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 2006 Arterial Scenario 25 mph - Summer
* File 1, Run 1, Scenario 5.
* # # # # # # # # # # # # # # # # # # # # # # # # #
 M583 Warning:
        The user supplied arterial average speed of 25.0
        will be used for all hours of the day.  100% of VMT
        has been assigned to the arterial/collector roadway
        type for all hours of the day and all vehicle types.
 M 48 Warning:
         there are no sales for vehicle class HDGV8b

 LEV phase-in data read from file MA_LEV2.D
```

Table I-4 MOBILE6.2.03 Output Files

```
              Calendar Year:  2006
                      Month:  July
                   Altitude:  Low
       Minimum Temperature:  68.0 (F)
       Maximum Temperature:  94.0 (F)
         Absolute Humidity:   75. grains/lb
       Fuel Sulfur Content:   30. ppm

       Exhaust I/M Program:  Yes
          Evap I/M Program:  Yes
               ATP Program:  Yes
          Reformulated Gas:  Yes

      Vehicle Type:    LDGV   LDGT12   LDGT34    LDGT    HDGV    LDDV    LDDT    HDDV     MC   All Veh
             GVWR:             <6000    >6000    (All)
                      ------  ------  ------  ------  ------  ------  ------  ------  ------  ------
   VMT Distribution:  0.3793  0.3529  0.1387          0.0362  0.0009  0.0015  0.0865  0.0041  1.0000
 Fuel Economy (mpg):    24.1    18.6    14.3    17.2     9.9    29.7    18.3     7.2    50.0    16.6
 -----------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
    Composite VOC :   0.700   0.538   0.636   0.566   0.781   0.605   0.601   0.585    4.05   0.640
    Composite CO  :    6.11    6.12    7.30    6.46    8.19   1.694   1.022   2.946   16.90   6.114
    Composite NOX :   0.615   0.679   1.033   0.779   2.885   1.026   0.854   9.353    1.12   1.536
    Composite CO2 :   368.6   476.2   620.7   517.0   897.9   342.3   555.6  1405.8   177.4  549.90
 -----------------------------------------------------------------------------------------------------
         Veh. Type:  GasBUS   URBAN  SCHOOL
                     ------  ------  ------
           VMT Mix:  0.0002  0.0009  0.0017
 Fuel Economy (mpg):    6.4     4.3     6.2
-----------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
    Composite VOC :  0.719   0.456   0.723
    Composite CO  :   9.25   4.156   2.171
    Composite NOX :  3.741  13.670   9.477
    Composite CO2 : 1376.9  2353.4  1646.0
-----------------------------------------------------------------------------------------------------


* # # # # # # # # # # # # # # # # # # # # # # # # #
* 2006 Arterial Scenario 30 mph - Summer
* File 1, Run 1, Scenario 6.
* # # # # # # # # # # # # # # # # # # # # # # # # #
 M583 Warning:
          The user supplied arterial average speed of 30.0
          will be used for all hours of the day.  100% of VMT
          has been assigned to the arterial/collector roadway
          type for all hours of the day and all vehicle types.
 M 48 Warning:
            there are no sales for vehicle class HDGV8b
```

Table I-4 MOBILE6.2.03 Output Files

```
 LEV phase-in data read from file MA_LEV2.D
                Calendar Year:  2006
                       Month:  July
                    Altitude:  Low
          Minimum Temperature:  68.0 (F)
          Maximum Temperature:  94.0 (F)
            Absolute Humidity:   75. grains/lb
          Fuel Sulfur Content:   30. ppm

          Exhaust I/M Program:  Yes
             Evap I/M Program:  Yes
                 ATP Program:  Yes
             Reformulated Gas:  Yes

      Vehicle Type:     LDGV   LDGT12   LDGT34    LDGT     HDGV     LDDV     LDDT     HDDV      MC   All Veh
             GVWR:              <6000    >6000    (All)
                       ------   ------   ------   ------   ------   ------   ------   ------   ------   ------
   VMT Distribution:   0.3793   0.3529   0.1387            0.0362   0.0009   0.0015   0.0865   0.0041   1.0000
 Fuel Economy (mpg):     24.1     18.6     14.3     17.2      9.9     29.7     18.3      7.2     50.0     16.6
 ---------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
    Composite VOC :    0.661    0.510    0.605    0.537    0.676    0.554    0.543    0.501     3.83    0.599
    Composite CO  :     6.08     6.14     7.30     6.47     6.79    1.539    0.916    2.436    14.61    6.005
    Composite NOX :    0.582    0.650    0.990    0.746    3.006    0.984    0.819    8.989     1.18    1.481
    Composite CO2 :    368.6    476.2    620.7    517.0    897.9    342.3    555.6   1405.8    177.4   549.90
 ---------------------------------------------------------------------------------------------------------
         Veh. Type:   GasBUS    URBAN   SCHOOL
                       ------   ------   ------
           VMT Mix:   0.0002   0.0009   0.0017
 Fuel Economy (mpg):      6.4      4.3      6.2
---------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
    Composite VOC :    0.625    0.391    0.620
    Composite CO  :     7.67    3.438    1.796
    Composite NOX :    3.898   13.054    9.051
    Composite CO2 :   1376.9   2353.4   1646.0
---------------------------------------------------------------------------------------------------------


* # # # # # # # # # # # # # # # # # # # # # # # # #
* 2006 Arterial Scenario 35 mph - Summer
* File 1, Run 1, Scenario 7.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
          The user supplied arterial average speed of 35.0
          will be used for all hours of the day.  100% of VMT
          has been assigned to the arterial/collector roadway
          type for all hours of the day and all vehicle types.
```

Table I-4 MOBILE6.2.03 Output Files

```
 M 48 Warning:
          there are no sales for vehicle class HDGV8b

 LEV phase-in data read from file MA_LEV2.D
               Calendar Year:  2006
                      Month:  July
                   Altitude:  Low
          Minimum Temperature:  68.0 (F)
          Maximum Temperature:  94.0 (F)
           Absolute Humidity:   75. grains/lb
          Fuel Sulfur Content:   30. ppm

          Exhaust I/M Program:  Yes
            Evap I/M Program:  Yes
                ATP Program:  Yes
            Reformulated Gas:  Yes

     Vehicle Type:     LDGV    LDGT12   LDGT34     LDGT     HDGV     LDDV     LDDT     HDDV       MC   All Veh
            GVWR:              <6000    >6000     (All)
                     ------   ------   ------   ------   ------   ------   ------   ------   ------   ------
  VMT Distribution:   0.3793   0.3529   0.1387             0.0362   0.0009   0.0015   0.0865   0.0041   1.0000
 Fuel Economy (mpg):    24.1     18.6     14.3     17.2      9.9     29.7     18.3      7.2     50.0     16.6
 ---------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
    Composite VOC :    0.632    0.489    0.579    0.515    0.605    0.516    0.499    0.439     3.66    0.569
    Composite CO  :     6.21     6.30     7.47     6.63     5.95    1.440    0.847    2.109    12.92    6.070
    Composite NOX :    0.563    0.636    0.973    0.731    3.128    0.975    0.811    8.916     1.22    1.464
    Composite CO2 :    368.6    476.2    620.7    517.0    897.9    342.3    555.6   1405.8    177.4   549.90
 ---------------------------------------------------------------------------------------------------------
        Veh. Type:   GasBUS    URBAN   SCHOOL
                     ------   ------   ------
          VMT Mix:   0.0002   0.0009   0.0017
 Fuel Economy (mpg):     6.4      4.3      6.2
---------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
    Composite VOC :    0.561    0.342    0.543
    Composite CO  :     6.72    2.976    1.555
    Composite NOX :    4.056   12.930    8.965
    Composite CO2 :   1376.9   2353.4   1646.0
---------------------------------------------------------------------------------------------------------


* # # # # # # # # # # # # # # # # # # # # # # # # #
* 2006 Arterial Scenario 50 mph - Summer
* File 1, Run 1, Scenario 8.
* # # # # # # # # # # # # # # # # # # # # # # # # #
 M583 Warning:
         The user supplied arterial average speed of 50.0
         will be used for all hours of the day.  100% of VMT
```

Table I-4 MOBILE6.2.03 Output Files

```
         has been assigned to the arterial/collector roadway
         type for all hours of the day and all vehicle types.
 M 48 Warning:
          there are no sales for vehicle class HDGV8b

 LEV phase-in data read from file MA_LEV2.D
              Calendar Year:  2006
                     Month:  July
                  Altitude:  Low
        Minimum Temperature:  68.0 (F)
        Maximum Temperature:  94.0 (F)
          Absolute Humidity:   75. grains/lb
         Fuel Sulfur Content:   30. ppm

         Exhaust I/M Program:  Yes
            Evap I/M Program:  Yes
                ATP Program:  Yes
           Reformulated Gas:  Yes

     Vehicle Type:   LDGV   LDGT12   LDGT34    LDGT    HDGV    LDDV    LDDT    HDDV     MC   All Veh
             GVWR:          <6000    >6000    (All)
                     ------  ------  ------  ------  ------  ------  ------  ------  ------  ------
 VMT Distribution:   0.3793  0.3529  0.1387          0.0362  0.0009  0.0015  0.0865  0.0041  1.0000
 Fuel Economy (mpg):   24.1    18.6    14.3    17.2     9.9    29.7    18.3     7.2    50.0    16.6
 ------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
   Composite VOC :   0.585   0.459   0.542   0.482   0.494   0.454   0.428   0.337    3.45   0.521
   Composite CO  :    7.39    7.45    8.76    7.82    5.56   1.345   0.783   1.798   10.70   7.048
   Composite NOX :   0.588   0.676   1.017   0.772   3.492   1.160   0.969  10.519    1.34   1.647
   Composite CO2 :   368.6   476.2   620.7   517.0   897.9   342.3   555.6  1405.8   177.4  549.90
 ------------------------------------------------------------------------------------------------
        Veh. Type:   GasBUS   URBAN   SCHOOL
                     ------  ------  ------
          VMT Mix:   0.0002  0.0009  0.0017
 Fuel Economy (mpg):    6.4     4.3     6.2
------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
   Composite VOC :   0.462   0.263   0.417
   Composite CO  :    6.28   2.537   1.325
   Composite NOX :   4.529  15.642  10.843
   Composite CO2 :  1376.9  2353.4  1646.0
------------------------------------------------------------------------------------------------
```

Table I-4 MOBILE6.2.03 Output Files

```
****************************************************************************
* MOBILE6.2.03 (24-Sep-2003)                                               *
* Input file: MA06PMO3.INP (file 1, run 1).                                *
****************************************************************************

* # # # # # # # # # # # # # # # # # # # # # # # # #
* PM 10 - Idle Scenario - Summer (multiply g/mi by 2.5 mph to get g/hr)
* File 1, Run 1, Scenario 1.
* # # # # # # # # # # # # # # # # # # # # # # # # #

                Calendar Year:  2006
                        Month:  July
     Gasoline Fuel Sulfur Content:   30. ppm
       Diesel Fuel Sulfur Content:  350. ppm
            Particle Size Cutoff: 10.00 Microns
               Reformulated Gas:  Yes

   Vehicle Type:    LDGV   LDGT12   LDGT34    LDGT    HDGV    LDDV    LDDT    HDDV     MC   All Veh
          GVWR:             <6000    >6000    (All)
                  ------   ------   ------   ------  ------  ------  ------  ------  ------  ------
 VMT Distribution:  0.3793   0.3529   0.1387           0.0362  0.0009  0.0015  0.0865  0.0041  1.0000
----------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
           Lead:  0.0000   0.0000   0.0000   0.0000  0.0000  ------  ------  ------  0.0000  0.0000
          GASPM:  0.0041   0.0041   0.0041   0.0041  0.0557  ------  ------  ------  0.0205  0.0057
        ECARBON:  ------   ------   ------   ------  ------  0.1235  0.0415  0.1726  ------  0.0151
        OCARBON:  ------   ------   ------   ------  ------  0.0348  0.0597  0.0864  ------  0.0076
            SO4:  0.0005   0.0006   0.0006   0.0006  0.0011  0.0039  0.0063  0.0214  0.0002  0.0024
 Total Exhaust PM:  0.0046   0.0047   0.0047   0.0047  0.0568  0.1622  0.1076  0.2804  0.0207  0.0308
          Brake:  0.0125   0.0125   0.0125   0.0125  0.0125  0.0125  0.0125  0.0125  0.0125  0.0125
           Tire:  0.0080   0.0080   0.0080   0.0080  0.0085  0.0080  0.0080  0.0247  0.0040  0.0094
       Total PM:  0.0252   0.0253   0.0253   0.0253  0.0778  0.1827  0.1281  0.3176  0.0372  0.0528
            SO2:  0.0067   0.0087   0.0114   0.0095  0.0165  0.0748  0.1214  0.3056  0.0033  0.0345
            NH3:  0.1015   0.1014   0.1014   0.1014  0.0451  0.0068  0.0068  0.0270  0.0113  0.0924
----------------------------------------------------------------------------------------------------
      Veh. Type:   GasBUS   URBAN   SCHOOL
                   ------   ------   ------
        VMT Mix:   0.0002   0.0009   0.0017
----------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
           Lead:  0.0000   ------   ------
          GASPM:  0.0523   ------   ------
        ECARBON:  ------   0.2009   0.1220
        OCARBON:  ------   0.1578   0.0958
            SO4:  0.0010   0.0358   0.0250
 Total Exhaust PM:  0.0534   0.3945   0.2428
          Brake:  0.0125   0.0125   0.0125
```

Table I-4 MOBILE6.2.03 Output Files

```
           Tire:   0.0120   0.0120   0.0120
       Total PM:   0.0779   0.4191   0.2674
            SO2:   0.0254   0.5117   0.3579
            NH3:   0.0451   0.0270   0.0270
-------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* PM 10 - Summer 15 mph
* File 1, Run 1, Scenario 2.
* # # # # # # # # # # # # # # # # # # # # # # # # #

                  Calendar Year:  2006
                          Month:  July
      Gasoline Fuel Sulfur Content:   30. ppm
        Diesel Fuel Sulfur Content:  350. ppm
             Particle Size Cutoff: 10.00 Microns
                 Reformulated Gas:  Yes

    Vehicle Type:    LDGV   LDGT12   LDGT34    LDGT    HDGV    LDDV    LDDT    HDDV      MC   All Veh
            GVWR:            <6000    >6000   (All)
                    ------  ------  ------  ------  ------  ------  ------  ------  ------  ------
 VMT Distribution:  0.3793  0.3529  0.1387          0.0362  0.0009  0.0015  0.0865  0.0041  1.0000
-------------------------------------------------------------------------------
Composite Emission Factors (g/mi):
           Lead:   0.0000   0.0000   0.0000   0.0000   0.0000   ------   ------   ------   0.0000   0.0000
          GASPM:   0.0041   0.0041   0.0041   0.0041   0.0557   ------   ------   ------   0.0205   0.0057
        ECARBON:   ------   ------   ------   ------   ------   0.1235   0.0415   0.1726   ------   0.0151
        OCARBON:   ------   ------   ------   ------   ------   0.0348   0.0597   0.0864   ------   0.0076
            SO4:   0.0005   0.0006   0.0006   0.0006   0.0011   0.0039   0.0063   0.0214   0.0002   0.0024
 Total Exhaust PM:   0.0046   0.0047   0.0047   0.0047   0.0568   0.1622   0.1076   0.2804   0.0207   0.0308
          Brake:   0.0125   0.0125   0.0125   0.0125   0.0125   0.0125   0.0125   0.0125   0.0125   0.0125
           Tire:   0.0080   0.0080   0.0080   0.0080   0.0085   0.0080   0.0080   0.0247   0.0040   0.0094
       Total PM:   0.0252   0.0253   0.0253   0.0253   0.0778   0.1827   0.1281   0.3176   0.0372   0.0528
            SO2:   0.0067   0.0087   0.0114   0.0095   0.0165   0.0748   0.1214   0.3056   0.0033   0.0345
            NH3:   0.1015   0.1014   0.1014   0.1014   0.0451   0.0068   0.0068   0.0270   0.0113   0.0924
-------------------------------------------------------------------------------
      Veh. Type:   GasBUS   URBAN   SCHOOL
                   ------   ------   ------
        VMT Mix:   0.0002   0.0009   0.0017
-------------------------------------------------------------------------------
Composite Emission Factors (g/mi):
           Lead:   0.0000   ------   ------
          GASPM:   0.0523   ------   ------
        ECARBON:   ------   0.2009   0.1220
        OCARBON:   ------   0.1578   0.0958
            SO4:   0.0010   0.0358   0.0250
 Total Exhaust PM:   0.0534   0.3945   0.2428
          Brake:   0.0125   0.0125   0.0125
```

Table I-4 MOBILE6.2.03 Output Files

```
          Tire:   0.0120   0.0120   0.0120
      Total PM:   0.0779   0.4191   0.2674
           SO2:   0.0254   0.5117   0.3579
           NH3:   0.0451   0.0270   0.0270
---------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* PM 10 - Summer 20 mph
* File 1, Run 1, Scenario 3.
* # # # # # # # # # # # # # # # # # # # # # # # # #

                 Calendar Year:  2006
                         Month:  July
     Gasoline Fuel Sulfur Content:   30. ppm
       Diesel Fuel Sulfur Content:  350. ppm
            Particle Size Cutoff: 10.00 Microns
               Reformulated Gas:  Yes

   Vehicle Type:    LDGV   LDGT12   LDGT34    LDGT    HDGV    LDDV    LDDT    HDDV     MC   All Veh
          GVWR:             <6000    >6000    (All)
                   ------   ------   ------   ------  ------  ------  ------  ------  ------  ------
 VMT Distribution:   0.3793   0.3529   0.1387          0.0362  0.0009  0.0015  0.0865  0.0041  1.0000
---------------------------------------------------------------------------------------
Composite Emission Factors (g/mi):
          Lead:   0.0000   0.0000   0.0000   0.0000   0.0000   ------   ------   ------   0.0000   0.0000
         GASPM:   0.0041   0.0041   0.0041   0.0041   0.0557   ------   ------   ------   0.0205   0.0057
       ECARBON:   ------   ------   ------   ------   ------   0.1235   0.0415   0.1726   ------   0.0151
       OCARBON:   ------   ------   ------   ------   ------   0.0348   0.0597   0.0864   ------   0.0076
           SO4:   0.0005   0.0006   0.0006   0.0006   0.0011   0.0039   0.0063   0.0214   0.0002   0.0024
 Total Exhaust PM:   0.0046   0.0047   0.0047   0.0047   0.0568   0.1622   0.1076   0.2804   0.0207   0.0308
         Brake:   0.0125   0.0125   0.0125   0.0125   0.0125   0.0125   0.0125   0.0125   0.0125   0.0125
          Tire:   0.0080   0.0080   0.0080   0.0080   0.0085   0.0080   0.0080   0.0247   0.0040   0.0094
      Total PM:   0.0251   0.0253   0.0253   0.0253   0.0779   0.1827   0.1281   0.3176   0.0372   0.0528
           SO2:   0.0067   0.0087   0.0114   0.0095   0.0165   0.0748   0.1214   0.3056   0.0033   0.0345
           NH3:   0.1015   0.1014   0.1014   0.1014   0.0451   0.0068   0.0068   0.0270   0.0113   0.0924
---------------------------------------------------------------------------------------
     Veh. Type:   GasBUS   URBAN   SCHOOL
                  ------   ------   ------
       VMT Mix:   0.0002   0.0009   0.0017
---------------------------------------------------------------------------------------
Composite Emission Factors (g/mi):
          Lead:   0.0000   ------   ------
         GASPM:   0.0523   ------   ------
       ECARBON:   ------   0.2009   0.1220
       OCARBON:   ------   0.1578   0.0958
           SO4:   0.0010   0.0358   0.0250
 Total Exhaust PM:   0.0534   0.3945   0.2428
         Brake:   0.0125   0.0125   0.0125
```

Table I-4 MOBILE6.2.03 Output Files

```
          Tire:   0.0120   0.0120   0.0120
      Total PM:   0.0779   0.4191   0.2674
           SO2:   0.0254   0.5117   0.3579
           NH3:   0.0451   0.0270   0.0270
-------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* PM 10 - Summer 25 mph
* File 1, Run 1, Scenario 4.
* # # # # # # # # # # # # # # # # # # # # # # # # #

                  Calendar Year:  2006
                          Month:  July
    Gasoline Fuel Sulfur Content:   30. ppm
      Diesel Fuel Sulfur Content:  350. ppm
           Particle Size Cutoff: 10.00 Microns
               Reformulated Gas:  Yes

   Vehicle Type:    LDGV   LDGT12   LDGT34    LDGT    HDGV    LDDV    LDDT    HDDV     MC   All Veh
           GVWR:             <6000   >6000   (All)
                   ------  ------  ------  ------  ------  ------  ------  ------  ------  ------
 VMT Distribution:   0.3793   0.3529   0.1387           0.0362   0.0009   0.0015   0.0865   0.0041   1.0000
-------------------------------------------------------------------------------------------------------------------
Composite Emission Factors (g/mi):
          Lead:   0.0000   0.0000   0.0000   0.0000   0.0000   ------   ------   ------   0.0000   0.0000
         GASPM:   0.0041   0.0042   0.0041   0.0042   0.0557   ------   ------   ------   0.0205   0.0057
      ECARBON:   ------   ------   ------   ------   ------   0.1235   0.0415   0.1726   ------   0.0151
      OCARBON:   ------   ------   ------   ------   ------   0.0348   0.0597   0.0864   ------   0.0076
           SO4:   0.0004   0.0005   0.0005   0.0005   0.0012   0.0039   0.0063   0.0214   0.0001   0.0023
 Total Exhaust PM:   0.0045   0.0047   0.0047   0.0047   0.0569   0.1622   0.1076   0.2804   0.0206   0.0307
         Brake:   0.0125   0.0125   0.0125   0.0125   0.0125   0.0125   0.0125   0.0125   0.0125   0.0125
          Tire:   0.0080   0.0080   0.0080   0.0080   0.0085   0.0080   0.0080   0.0247   0.0040   0.0094
      Total PM:   0.0251   0.0253   0.0252   0.0253   0.0780   0.1827   0.1281   0.3176   0.0372   0.0527
           SO2:   0.0067   0.0087   0.0114   0.0095   0.0164   0.0748   0.1214   0.3056   0.0033   0.0345
           NH3:   0.1015   0.1014   0.1014   0.1014   0.0451   0.0068   0.0068   0.0270   0.0113   0.0924
-------------------------------------------------------------------------------------------------------------------
     Veh. Type:   GasBUS   URBAN   SCHOOL
                   ------  ------  ------
       VMT Mix:   0.0002   0.0009   0.0017
-------------------------------------------------------------------------------------------------------------------
Composite Emission Factors (g/mi):
          Lead:   0.0000   ------   ------
         GASPM:   0.0523   ------   ------
       ECARBON:   ------   0.2009   0.1220
       OCARBON:   ------   0.1578   0.0958
           SO4:   0.0011   0.0358   0.0250
 Total Exhaust PM:   0.0535   0.3945   0.2428
         Brake:   0.0125   0.0125   0.0125
```

Table I-4 MOBILE6.2.03 Output Files

```
           Tire:   0.0120   0.0120   0.0120
       Total PM:   0.0781   0.4191   0.2674
            SO2:   0.0254   0.5117   0.3579
            NH3:   0.0451   0.0270   0.0270
------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* PM 10 - Summer 30 mph
* File 1, Run 1, Scenario 5.
* # # # # # # # # # # # # # # # # # # # # # # # # #

                    Calendar Year:  2006
                            Month:  July
        Gasoline Fuel Sulfur Content:   30. ppm
          Diesel Fuel Sulfur Content:  350. ppm
               Particle Size Cutoff: 10.00 Microns
                    Reformulated Gas:  Yes

   Vehicle Type:    LDGV   LDGT12   LDGT34    LDGT    HDGV    LDDV    LDDT    HDDV     MC   All Veh
           GVWR:            <6000    >6000    (All)
                   ------  ------   ------  ------  ------  ------  ------  ------  ------  ------
 VMT Distribution:  0.3793  0.3529   0.1387           0.0362  0.0009  0.0015  0.0865  0.0041  1.0000
------------------------------------------------------------------------------------------------------------
Composite Emission Factors (g/mi):
           Lead:   0.0000  0.0000  0.0000  0.0000  0.0000  ------  ------  ------  0.0000  0.0000
          GASPM:   0.0041  0.0042  0.0042  0.0042  0.0557  ------  ------  ------  0.0205  0.0057
        ECARBON:   ------  ------  ------  ------  ------  0.1235  0.0415  0.1726  ------  0.0151
        OCARBON:   ------  ------  ------  ------  ------  0.0348  0.0597  0.0864  ------  0.0076
            SO4:   0.0003  0.0005  0.0005  0.0005  0.0013  0.0039  0.0063  0.0214  0.0001  0.0023
 Total Exhaust PM:  0.0045  0.0047  0.0047  0.0047  0.0571  0.1622  0.1076  0.2804  0.0206  0.0307
          Brake:   0.0125  0.0125  0.0125  0.0125  0.0125  0.0125  0.0125  0.0125  0.0125  0.0125
           Tire:   0.0080  0.0080  0.0080  0.0080  0.0085  0.0080  0.0080  0.0247  0.0040  0.0094
       Total PM:   0.0250  0.0252  0.0252  0.0252  0.0781  0.1827  0.1281  0.3176  0.0371  0.0527
            SO2:   0.0068  0.0087  0.0115  0.0095  0.0164  0.0748  0.1214  0.3056  0.0033  0.0345
            NH3:   0.1015  0.1014  0.1014  0.1014  0.0451  0.0068  0.0068  0.0270  0.0113  0.0924
------------------------------------------------------------------------------------------------------------
      Veh. Type:   GasBUS   URBAN   SCHOOL
                   ------  ------  ------
        VMT Mix:   0.0002  0.0009  0.0017
------------------------------------------------------------------------------------------------------------
Composite Emission Factors (g/mi):
           Lead:   0.0000  ------  ------
          GASPM:   0.0523  ------  ------
        ECARBON:   ------  0.2009  0.1220
        OCARBON:   ------  0.1578  0.0958
            SO4:   0.0013  0.0358  0.0250
 Total Exhaust PM:  0.0536  0.3945  0.2428
          Brake:   0.0125  0.0125  0.0125
```

Table I-4 MOBILE6.2.03 Output Files

```
           Tire:   0.0120   0.0120   0.0120
       Total PM:   0.0782   0.4191   0.2674
            SO2:   0.0254   0.5117   0.3579
            NH3:   0.0451   0.0270   0.0270
-------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* PM 10 - Summer 35 mph
* File 1, Run 1, Scenario 6.
* # # # # # # # # # # # # # # # # # # # # # # # # #

                Calendar Year:  2006
                        Month:  July
      Gasoline Fuel Sulfur Content:   30. ppm
        Diesel Fuel Sulfur Content:  350. ppm
             Particle Size Cutoff: 10.00 Microns
                 Reformulated Gas:  Yes

   Vehicle Type:    LDGV   LDGT12   LDGT34    LDGT    HDGV    LDDV    LDDT    HDDV     MC   All Veh
           GVWR:            <6000    >6000    (All)
                  ------   ------   ------   ------   ------   ------   ------   ------   ------   ------
 VMT Distribution:  0.3793   0.3529   0.1387            0.0362   0.0009   0.0015   0.0865   0.0041   1.0000
-------------------------------------------------------------------------------------------------------------
Composite Emission Factors (g/mi):
           Lead:   0.0000   0.0000   0.0000   0.0000   0.0000   ------   ------   ------   0.0000   0.0000
          GASPM:   0.0042   0.0042   0.0042   0.0042   0.0557   ------   ------   ------   0.0205   0.0057
        ECARBON:   ------   ------   ------   ------   ------   0.1235   0.0415   0.1726   ------   0.0151
        OCARBON:   ------   ------   ------   ------   ------   0.0348   0.0597   0.0864   ------   0.0076
            SO4:   0.0002   0.0004   0.0004   0.0004   0.0015   0.0039   0.0063   0.0214   0.0001   0.0022
 Total Exhaust PM:   0.0044   0.0046   0.0046   0.0046   0.0572   0.1622   0.1076   0.2804   0.0206   0.0307
          Brake:   0.0125   0.0125   0.0125   0.0125   0.0125   0.0125   0.0125   0.0125   0.0125   0.0125
           Tire:   0.0080   0.0080   0.0080   0.0080   0.0085   0.0080   0.0080   0.0247   0.0040   0.0094
       Total PM:   0.0250   0.0252   0.0252   0.0252   0.0782   0.1827   0.1281   0.3176   0.0371   0.0527
            SO2:   0.0068   0.0088   0.0115   0.0095   0.0164   0.0748   0.1214   0.3056   0.0033   0.0346
            NH3:   0.1015   0.1014   0.1014   0.1014   0.0451   0.0068   0.0068   0.0270   0.0113   0.0924
-------------------------------------------------------------------------------------------------------------
      Veh. Type:   GasBUS   URBAN   SCHOOL
                   ------   ------   ------
        VMT Mix:   0.0002   0.0009   0.0017
-------------------------------------------------------------------------------------------------------------
Composite Emission Factors (g/mi):
           Lead:   0.0000   ------   ------
          GASPM:   0.0523   ------   ------
        ECARBON:   ------   0.2009   0.1220
        OCARBON:   ------   0.1578   0.0958
            SO4:   0.0014   0.0358   0.0250
 Total Exhaust PM:   0.0538   0.3945   0.2428
          Brake:   0.0125   0.0125   0.0125
```

Table I-4 MOBILE6.2.03 Output Files

```
          Tire:   0.0120   0.0120   0.0120
      Total PM:   0.0783   0.4191   0.2674
           SO2:   0.0253   0.5117   0.3579
           NH3:   0.0451   0.0270   0.0270
--------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* PM 10 - Summer 50 mph
* File 1, Run 1, Scenario 7.
* # # # # # # # # # # # # # # # # # # # # # # # # #

                Calendar Year:  2006
                        Month:  July
    Gasoline Fuel Sulfur Content:   30. ppm
      Diesel Fuel Sulfur Content:  350. ppm
          Particle Size Cutoff: 10.00 Microns
             Reformulated Gas:  Yes

  Vehicle Type:    LDGV   LDGT12   LDGT34    LDGT    HDGV    LDDV    LDDT    HDDV      MC   All Veh
          GVWR:             <6000    >6000    (All)
                 ------  ------  ------  ------  ------  ------  ------  ------  ------  ------
 VMT Distribution:  0.3793   0.3529   0.1387          0.0362   0.0009   0.0015   0.0865   0.0041   1.0000
--------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
          Lead:   0.0000   0.0000   0.0000   0.0000   0.0000   ------   ------   ------   0.0000   0.0000
         GASPM:   0.0042   0.0042   0.0042   0.0042   0.0557   ------   ------   ------   0.0205   0.0057
      ECARBON:   ------   ------   ------   ------   ------   0.1235   0.0415   0.1726   ------   0.0151
      OCARBON:   ------   ------   ------   ------   ------   0.0348   0.0597   0.0864   ------   0.0076
           SO4:   0.0002   0.0004   0.0004   0.0004   0.0015   0.0039   0.0063   0.0214   0.0001   0.0022
 Total Exhaust PM:   0.0044   0.0046   0.0046   0.0046   0.0572   0.1622   0.1076   0.2804   0.0206   0.0307
         Brake:   0.0125   0.0125   0.0125   0.0125   0.0125   0.0125   0.0125   0.0125   0.0125   0.0125
          Tire:   0.0080   0.0080   0.0080   0.0080   0.0085   0.0080   0.0080   0.0247   0.0040   0.0094
      Total PM:   0.0250   0.0252   0.0252   0.0252   0.0782   0.1827   0.1281   0.3176   0.0371   0.0527
           SO2:   0.0068   0.0088   0.0115   0.0095   0.0164   0.0748   0.1214   0.3056   0.0033   0.0346
           NH3:   0.1015   0.1014   0.1014   0.1014   0.0451   0.0068   0.0068   0.0270   0.0113   0.0924
--------------------------------------------------------------------------------
     Veh. Type:   GasBUS    URBAN    SCHOOL
                 ------   ------   ------
       VMT Mix:   0.0002   0.0009   0.0017
--------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
          Lead:   0.0000   ------   ------
         GASPM:   0.0523   ------   ------
      ECARBON:   ------   0.2009   0.1220
      OCARBON:   ------   0.1578   0.0958
           SO4:   0.0014   0.0358   0.0250
 Total Exhaust PM:   0.0538   0.3945   0.2428
         Brake:   0.0125   0.0125   0.0125
```

Table I-4 MOBILE6.2.03 Output Files

```
        Tire:   0.0120   0.0120   0.0120
    Total PM:   0.0783   0.4191   0.2674
         SO2:   0.0253   0.5117   0.3579
         NH3:   0.0451   0.0270   0.0270
------------------------------------------------------------------------------
 NH3:   0.0451   0.0270   0.0270 --
```

Fuel Storage and Handling

As in previous years, volatile organic compounds (VOC) emissions from fuel storage and handling were calculated using methods based on EPA's AP-42[3] document. Calculations are made to account for evaporative emissions from breathing losses, working losses, and spillage from above-ground storage tanks, underground storage tanks, and aircraft refueling. In 2003, additional information became available on the fire training fuel, Tek-Flame®. Emissions of VOCs from this fuel were estimated by EDMS. Table I-5 presents Logan Airport's fuel throughput by category.

Table I-5 Fuel Throughput by Fuel Category (gallons)

Fuel Category	1999	2000	2001	2002	2003	2004	2005	2006
Jet Fuel	354,095,516	441,901,932	416,748,819	358,190,362	319,439,910	373,996,141	368,645,392	**364,450,864**
Fire Training Fuel[1]	23,000	NA	NA	NA	13,719	12,227	8,105	**5,000**
Aviation Gas	99,726	90,922	60,691	35,111	32,515	34,717	52,487	**35,098**
Auto Gas	7,200,000	7,569,206	6,181,472	5,754,740	5,436,322	5,803,442	5,903,424	**6,028,931**
Diesel	768,106	839,751	1,239,904	1,067,847	1,030,185	1,078,665	1,567,688	**1,164,493**
Heating Oil No.2	480,733	494,500	582,283	340,492	370,903	381,852	367,899	**259,768**
Heating Oil No.6	1,600,893	1,555,527	1,641,693	1,079,283	1,122,975	2,940,752	3,098,126	**1,396,529**

Source: Massport, 2007.
Note: Tek-Flame® Fuel was not used until 2003. Jet A Fuel was used prior to 2003.
NA Data not available.

3 Compilation of Air Pollutant Emission Factors, AP-42, Office of Air Quality Planning and Standards, EPA, Fifth Edition,1995.

Stationary Sources

Stationary sources include the Central Heating and Cooling Plant, emergency generators, snow melters, and boilers. Emission factors from EPA's AP-42 were combined with the actual 2006 fuel throughput of the stationary sources to obtain emissions of VOCs, NO_X, CO, and $PM_{10}/PM_{2.5}$.

Title V of the 1990 CAA Amendments requires facilities with air emissions to document their emissions and obtain a single permit combining all sources. The permitting program ensures that all emission sources are accounted for, the proper permits have been received, and permit conditions are being followed. A Title V Air Operating Permit covers all of the stationary sources at Logan Airport including boilers, emergency generators, snow melters, cooling towers, paint booths, de-icing facilities, and storage tanks. Table I-6 presents Logan Airport's stationary source fuel throughput by fuel category.

Table I-6 Stationary Source Fuel Throughput by Fuel Category (gallons)

Fuel Category	1999	2000	2001	2002	2003	2004	2005	2006
Natural Gas (ft^3)	183,943,000	283,720,049	199,500,000	268,359,282	201,714,114	62,610,000	92,460,000	**112,390,000**
Heating Oil No. 2	480,733	494,500	582,283	340,492	370,903	381,852	367,899	**259,768**
Heating Oil No. 6	1,600,893	1,555,527	1,641,693	1,079,283	1,122,975	2,940,752	3,098,126	**1,396,529**
Diesel Fuel[1]	57,441	NA	NA	NA	NA	67,198	77,848	**77,848**
Fire Training Fuel[2]	23,000	NA	NA	NA	13,719	12,227	8,105	**5,000**

Source: Massport, 2007.
1 Diesel fuel was from the stationary snow melter usage.
2 Fire Training Fuel used in 1999 was Jet A Fuel while in 2003 through 2006 it was Tek-Flame®.
NA Information not available.

massport

Massachusetts Port Authority
One Harborside Drive, Suite 200S
East Boston, MA 02128-2909
Telephone (617) 428-2800
www.massport.com

August 30, 2006

RE: Single/Reduced Engine Taxiing

Dear :

As proprietor of Boston-Logan International Airport ("Logan"), Massport strives to implement improvements that will provide an operating infrastructure for aircraft that enhances safety, efficiency and opportunities for reducing or mitigating environmental impacts. This effort involves extensive planning, technical analysis, effective communication and cooperation among the various affected constituencies, including the air carriers operating at Logan.

One of the major undertakings to advance these goals has been the Logan Airside Improvement Planning Project that resulted in the approval and ongoing· implementation of a number of physical changes to Logan's airfield, including new unidirectional Runway 14-32 that is expected to become operational in November, 2006. The FAA has also recently completed additional analysis related to the proposed new 9300 foot Centerfield Taxiway between Runways 4L/22R and 4R/22L designed to provide alternative taxi routing for more efficient movement of aircraft between runways and terminals. It is our hope that FAA will issue a Record of Decision within the next several weeks that will allow Massport to proceed to construct and operate this Centerfield Taxiway.

Our ability to implement such improvements at Logan is based in part on the assessment, identification, and utilization of appropriate measures to mitigate environmental impacts from various landside and airside operations. One such mitigation measure that was identified in the legally mandated state and federal environmental review process for the Logan Airside Improvement Planning Project is single/reduced engine taxiing. As part of its mitigation program for this Project Massport undertook to "develop and implement a program designed to maximize the use of single-engine taxi procedures by all of its tenant airlines, consistent with safety requirements, pilot judgment and the requirements of federal laws." This undertaking was based on two premises: first, that taxiing at single or reduced engine levels has potential for achieving air emissions reduction benefits, and, second, that the ultimate decision as to engine utilization and the conduct of taxiing operations rests with the aircraft's pilot-in-command.

Our periodic monitoring of taxiing procedures at Logan indicates that single or reduced engine taxiing is being implemented by a number of Logan airline tenants when deemed appropriate by the pilot. While reducing emissions is our primary goal for encouraging single engine taxiing, fuel savings is a significant ancillary benefit that is the motivation for several air carriers and should be a motivation for others. It is our hope that the current level of implementation will continue and will increase where feasible. To this end we request that you review your procedures in this area and, to the extent not already covered by your operating procedures or other relevant guidance documents, encourage the utilization of single or reduced engine taxiing procedures at Logan, subject, of course, to pilot judgment, engine maintenance and performance considerations and, above all, safety.

We will contact you in the near future to review with you your policies and efforts on this important subject. In the meantime if you have any questions or would like to discuss any aspect of this letter, please feel free to contact me at your earliest convenience.

Sincerely,

Thomas J. Kinton, Jr.
CEO & Executive Director

J

Water Quality/ Environmental Compliance and Management

This appendix provides detailed information in support of *Chapter 8, Water Quality/ Environmental Compliance and Management*.

- Table J-1 Logan Airport Stormwater Outfalls Sampling Results
- Table J-2 Type and Quantity of All Spills at Logan Airport – 1999- 2006
- EnviroNews Issue No. 24, Quarter I – 2006
  Issue No. 25, Quarter II – 2006
  Issue No. 26, Quarter III – 2006
  Issue No. 27, Quarter IV – 2006

Table J-1 Logan Airport Stormwater Outfalls Sampling Results

Date	Weather	North Outfall Sampling Results			West Outfall Sampling Results			Porter Outfall		Maverick Outfall	
		O&G[1]	SS[2]	pH[3]	O&G	SS	pH	O&G	pH	O&G	pH
First Quarter 2006											
January 29	Dry	<5.0	<0.1	7.0	<5.0	<0.1	7.0	<5.0	6.9	12	7.0
January 18	Wet	14	<0.1	7.0	6.9	<0.1	6.9	<5.0	6.9	<5.0	7.0
January 19	After wet	<5.0	<0.1	7.1	<5.0	<0.1	7.0	<5.0	6.9	<5.0	6.9
February 8	Dry	<5.0	<0.1	6.9	<5.0	<0.1	6.8	<5.0	6.9	<5.0	6.9
February 25	Wet	<5.0	<0.1	7.4	<5.0	<0.1	6.9	<5.0	6.9	<5.0	7.0
February 26	After wet	8.4	<0.1	6.8	6.1	0.3	6.9	<5.0	6.8	<5.0	6.8
March 22	Dry	<5.0	<0.1	6.9	<5.0	<0.1	6.9	<5.0	6.8	<5.0	6.9
March 14	Wet	<5.0	<0.1	7.1	<5.0	<0.1	6.9	<5.0	6.8	**17**	6.9
March 15	After wet	<5.0	<0.1	7.1	<5.0	<0.1	6.9	<5.0	6.8	<5.0	6.9
Minimum:		<5.0	<0.1	6.8	<5.0	<0.1	6.8	<5.0	6.8	<5.0	6.8
Average:		2.5	<0.1	7.0	1.4	0.03	6.9	<5.1	6.9	14.5	6.9
Maximum:		14.0	<0.1	7.4	6.9	0.3	7.0	<5.0	6.9	17.0	7.0
Second Quarter 2006											
April 10	Dry	<5.0	<0.1	7.0	<5.0	<0.1	7.0	<5.0	7.0	<5.0	7.0
April 4	Wet	7.6	<0.1	7.1	7.4	<0.1	7.0	<5.0	7.0	7.3	7.0
April 6	After wet	<5.0	<0.1	7.0	<5.0	<0.1	7.1	5.5	7.0	<5.0	6.9
May 25	Dry	<5.0	<0.1	7.2	<5.0	<0.1	7.4	<5.0	7.4	<5.0	7.4
May 2	Wet	<5.0	<0.1	7.3	<5.0	0.2	7.2	<5.0	7.2	<5.0	7.1
May 4	After wet	<5.0	<0.1	7.1	**18**	<0.1	7.1	<5.0	7.1	<5.0	7.1
June 22	Dry	<5.0	<0.1	7.4	<5.0	<0.1	7.2	<5.0	7.3	<5.0	7.3
June 7	Wet	<5.0	<0.1	7.3	<5.0	<0.1	7.5	<5.0	7.3	<5.0	7.2
June 12	After wet	<5.0	<0.1	7.4	<5.0	<0.1	7.2	<5.0	7.2	<5.0	7.2
Minimum:		<5.0	<0.1	7.0	<5.0	<0.1	7.0	<5.0	7.0	<5.0	6.9
Average:		2.5	<0.1	7.2	2.8	0.02	7.2	0.61	7.2	0.81	7.1
Maximum:		7.6	<0.1	7.4	18.0	0.2	7.5	5.5	7.4	7.3	7.4
NPDES Permit Limits (Permit # MA 0000787)											
Daily Minimum:				6.0			6.0		6.0		6.0
Daily Average:			0.1			0.1					
Daily Maximum:		15.0	0.3	8.5	15.0	0.3	8.5	15.0	8.5	15.0	8.5

1 Oil and grease analysis by US Environmental Protection Agency (EPA) Method 1664. Reported in milligrams per liter (mg/l).
2 Total settleable solids analysis by EPA Method 160.5. Reported in milliliters per liter (ml/l).
3 pH measured in the field and reported in standard pH units.
< Indicates constituent not detected above given limit. A value of zero is assumed for these samples in order to calculate an average value for the quarter.
Results in **boldface** represent permit limit exceedances. Exceedances of the National Pollutant Discharge Elimination System (NPDES) Permit limits are reported to the EPA within 5 days of becoming aware of such exceedances.
NC Not Collected, conditions did not meet EPA sampling guidelines.

Table J-1 Logan Airport Stormwater Outfalls Sampling Results (Continued)

		North Outfall Sampling Results			West Outfall Sampling Results			Porter Outfall		Maverick Outfall	
Date	**Weather**	**O&G[1]**	**SS[2]**	**pH[3]**	**O&G**	**SS**	**pH**	**O&G**	**pH**	**O&G**	**pH**
Third Quarter 2006											
July 21	Dry	<5.0	<0.1	7.3	<5.0	<0.1	7.4	<5.0	7.3	<5.0	7.4
NC	Wet										
NC	After wet										
August 3	Dry	<5.0	<0.1	7.6	<5.0	<0.1	7.6	<5.0	7.6	<5.0	7.7
August 4	Wet	<5.0	**0.5**	7.8	<5.0	0.1	7.5	<5.0	7.3	<5.0	7.4
August 5	After wet	<5.0	<0.1	7.4	<5.0	<0.1	7.5	<5.0	7.4	<5.0	7.4
September 11	Dry	<5.0	**15**	7.8	<5.0	<0.1	7.6	<5.0	7.5	<5.0	7.6
September 28	Dry		<0.1	7.6							
NC	Wet										
September 29	After Wet	<5.0	<0.1	8.1	<5.0	<0.1	7.7	<5.0	7.7	<5.0	7.5
Minimum:		<5.0	<0.1	7.3	<5.0	<0.1	7.4	<5.0	7.3	<5.0	7.4
Average:		<5.0	2.2	7.7	<5.0	0.02	7.6	<5.0	7.5	<5.0	7.5
Maximum:		<5.0	15	8.1	<5.0	0.1	7.7	<5.0	7.7	<5.0	7.7
Fourth Quarter 2006											
October 27	Dry	<5.0	<0.1	8.0	<5.0	<0.1	7.6	<5.0	7.6	<5.0	7.5
October 12	Wet	<5.0	<0.1	8.2	<5.0	<0.1	8.2	<5.0	7.9	<5.0	7.5
October 13	After wet	<5.0	<0.1	8.1	<5.0	<0.1	7.5	<5.0	7.9	<5.0	7.5
November 27	Dry	<5.0	<0.1	8.1	<5.0	<0.1	7.8	5.3	7.7	<5.0	7.6
December 1	Wet	<5.0	<0.1	8.0	<5.0	<0.1	7.5	<5.0	7.9	<5.0	7.7
November 24	After wet	<5.0	<0.1	7.8	<5.0	<0.1	7.7	<5.0	7.8	<5.0	7.3
December 20	Dry	<5.0	<0.1	8.1	<5.0	<0.1	7.9	<5.0	7.9	<5.0	7.9
December 23	Wet	<5.0	<0.1 H	8.2	<5.0	0.2 H	7.4	<5.0	7.4	<5.0	7.3
December 24	After wet	<5.0	<0.1	8.4	<5.0	<0.1	7.7	<5.0	7.3	<5.0	7.3
Minimum:		<5.0	<0.1	7.8	<5.0	<0.1	7.4	<5.0	7.3	<5.0	7.3
Average:		<5.0	<0.1	8.1	<5.0	0.02	7.7	0.6	7.7	<5.0	7.5
Maximum:		<5.0	<0.1	8.4	<5.0	0.2 H	8.2	5.3	7.9	<5.0	7.9
2006											
Minimum:		<5.0	<0.1	6.8	<5.0	<0.1	6.8	<5.0	6.8	<5.0	6.8
Maximum:		14.0	**15**	8.4	**18.0**	0.3	8.2	5.5	7.9	**17.0**	7.9
NPDES Permit Limits (Permit # MA 000787)											
Daily Minimum:				6.0			6.0		6.0		6.0
Daily Average:			0.1			0.1					
Daily Maximum:		15.0	0.3	8.5	15.0	0.3	8.5	15.0	8.5	15.0	8.5

1 Oil and grease analysis by EPA Method 1664. Reported in mg/l.
2 Total settleable solids analysis by EPA Method 160.5. Reported in ml/l.
3 pH measured in the field and reported in standard pH units.
NC Samples could not be collected due to exceptional weather conditions.
H Method-prescribed holding time was exceeded — laboratory was closed due to holiday.
< Indicates constituent not detected above given limit. A value of zero is assumed for these samples in order to calculate an average value for the quarter.
Results in **boldface** represent permit limit exceedances. Exceedances of the NPDES Permit limits are reported to the EPA within 5 days of becoming aware of such exceedances.

Table J-2 Type and Quantity of Oil and Hazardous Material Spills at Logan Airport - 1999 to 2006

	Jet Fuel			Hydraulic Oil			Diesel Fuel			Gasoline			Other		
Year	No. of Spills	Quantity (Gallons)	No. of Spills ≥10 Gallons	No. of Spills	Quantity (Gallons)	No. of Spills ≥10 Gallons	No. of Spills	Quantity (Gallons)	No. of Spills ≥10 Gallons	No. of Spills	Quantity (Gallons)	No. of Spills ≥10 Gallons	No. of Spills	Quantity (Gallons)	No. of Spills ≥10 Gallons
1999	151	7,012	40	24	67	1	13	49	2	5	7	0	3	16	0
2000	115	1,227	18	8	59	2	3	11	0	8	16	0	2	5	0
2001	104	1,771	32	21	92	3	5	30	1	6	26	1	3	5	0
2002	79	559	15	7	38	0	8	37	1	4	8	0	3	11	0
2003	89	10,188	15	15	91	3	15	30	0	7	24	0	2	31	1
2004	82	574	12	17	189	4	14	52	0	7	26	0	6[1]	53[2]	2[3]
2005	66	585	12	14	78	1	7	1,610	2	7	45	0	3[4]	1	0
2006	**65**	**644**	**9**	**10**	**25**	**0**	**6**	**57**	**1**	**4**	**9**	**0**	**7**	**17**	**1**

1 Includes two Unknown spills (14 gallons), plus one spill of each of the following: Ethylene Glycol, Propylene Glycol, AVGAS, and Paint.
2 Ethylene Glycol (25 gallons), Propylene Glycol (10 gallons), AVGAS (1 gallon) and Paint (3 gallons).
3 One spill of Ethylene Glycol; one spill of Propylene Glycol.
4 Includes two spills of an unknown substance and volume.

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EnviroNews

Published by the
Environmental Management Unit
Logan Office Center
A quarterly environmental newsletter
Issue No. 24, Quarter I - 2006

EPA Reveals Inspection Targets

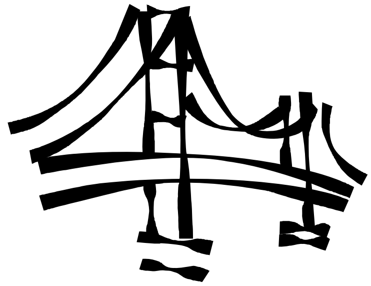
President Bush plans to increase the Environmental Protection Agency's (EPA) enforcement efforts for Fiscal Year 2007. Although the budget has decreased, the enforcement and compliance portions have increased. The EPA already conducts over 22,000 compliance inspections a year. Facilities can expect enforcement to continue.

The EPA has eight target enforcement priorities that include:

- Air toxic emission releases regulated under EPA's maximum achievable control technology rules
- Smog and ozone emission that exceed local state implementation plans
- Stormwater runoff controls and prevention planning
- Oil spill control plans
- Hazardous waste management
- Risk management plans
- Hazardous chemical release reporting required under the Emergency Planning and Community Right-to-know Act
- New source review

Excerpted from Environmental Compliance Alert February 24, 2006

Tobin Bridge First with ISO 14001



The Tobin Bridge has become the first toll bridge to achieve ISO 14001 Certification for their Environmental Management System (EMS). The Bridge worked on the development of the program for over a year and had the final certification audit on February 28, 2006. An EMS is a tool that allows an organization to better control the impacts of their activities and services on the natural environment.

As part of the EMS a set of programs has been established that include objectives and targets that will be implemented over the next several months. These include programs to examine alternative products for decking reconstruction and using rerefined oil.

Tobin Bridge is the third Massport facility to be certified to the ISO 14001 Standard, Hanscom Field was certified in 2001 and Conley Terminal in 2003. Development of an EMS is currently underway for Logan's Facilities II Department with plans for certification by spring of 2007.

Recycling Update

Batteries and Cell Phones:

Massport has joined the Rechargeable Battery Recycling Corporation's Call2Recycle initiative. Through this initiative rechargeable batteries and cell phones can be recycled at no cost to Massport. Contact Dave Church in the Radio Shop or Jenna Newcombe in Environmental Management to recycle your batteries or cell phones.

Paper:

The Massport Fish Pier Support Services Materials Management recycled **10,390 pounds of paper in 2005.** This saved 88 trees and 15.59 cubic yards of landfill space.

EnviroQuestion

How many tons of road salt are used each year in the United States?

Answer in the next issue.

Quarter IV Question: What kinds of air pollution are produced by mobile sources?

Answer: hydrocarbons (HC), carbon monoxide (CO), oxides of nitrogen (NOx), particulate matter (PM), toxics, sulfur dioxide (SO2), and greenhouse gases such as carbon dioxide (CO2) and nitrous oxide (N2O).

Initiative Launched to Reduce Greenhouse Gas Emissions

The Environmental Protection Agency (EPA) and the Air-Conditioning and Refrigeration Institute have started an initiative that promotes environmentally responsible mangement of fluorocarbon refrigerants in the annual manufacture of more than 8 million residential and commercial air conditioning units and refrigeration systems.

The plan will minimize emission of two chemicals in air-conditioning and refrigeration equipment. Hydro chlorofluorocarbons, which deplete the ozone layer, are being phased out under the Montreal Protocol and the Clean Air Act. The other chemical is hydro fluorocarbons which is used as a substitute because it does not deplete the ozone layer. Hydro fluorocarbons are strong greenhouse gases, up to 3,000 times more potent that carbon monoxide.

The initiative builds upon guidelines developed by governmental and industry groups in 2002. The plan contains strategies for reducing emissions during all phases of productions, including delivery, storage, transfer of refrigerants, system charging, testing, and material recovery. The guidelines provide a framework for protecting the environment above and beyond what is currently mandated.

EPA is also working with key sectors to quantify and reduce emissions, and to promote efficient, climate and ozone friendly technologies in the United States.

From Environmental Tip of the Week, March 13, 2006

COMPLIANCE FINE

The Washington Department of Ecology fined the Port of Seattle for allowing muddy runoff from runway projects to enter storm drains, and for pumping wash water from truck cleaning operations into a stormwater management pond. The final penalty paid by the Port of Seattle was $81,000.

Excerpted from Environmental Compliance Alert, February 13, 2006

FOR YOUR INFORMATION

Is Your Car Green or Mean?

The American Council for an Energy-Efficient Economy (ACEEE) announced the year's "greenest" and "meanest" vehicles, along with environmental scorings of all 2006 model year cars and passenger trucks.

The "greenest vehicle" title went to the hybrid-electric Honda Insight. The remaining cars in the top five were the natural gas-powered Honda Civic GX, the Toyota Prius, Honda Civic hybrid and Toyota Corolla. Hybrids as a whole continued to perform well.

The list, which can be found on the website GreenerCars.com, also identifies models in each class. The green car list also includes the Ford Escape Hybrid SUV, the Honda Odyssey minivan and the Toyota Tundra pickup, demonstrating a consumer has green options in every class.

The "meanest vehicle for the environment" is the 8.3 liter, 500-horsepower Dodge Ram SRT10 pickup truck. Also in the bottom five are the Lamborghini Murcielago, the Bentley Arnage, the Dodge Durango, and the Dodge Ram 1500 pickup.

By choosing a greener car a consumer can save up to $510 in gasoline and cut carbon emissions by 30%.

From Environmental Tip of the Week, March 13, 2006

EnviroNews

Regulatory Updates

Hazardous Waste Manifests Are Changing

Big changes are coming from the Environmental Protection Agency (EPA) to the Hazardous Waste Uniform Manifest. On September 5, 2006 companies will be required to use the new Federal Uniform Manifest. Fourteen (14) companies have applied for approval to print the new uniform manifests. Although the EPA has not approved printers for the new form, the September date still applies.

Historic Milestone Marked in Clean Diesel

Starting on June 1, 2006 the EPA will require refiners and fuel importers to cut the sulfur content of highway diesel fuel 97 percent. Sulfur content will go from 500 parts per million (ppm) to 15. by implementing the new rule for Ultra Low Sulfur Diesel (ULSD) not only will environmental protection be enhanced but will prevent nearly 8,300 premature deaths and tens of thousands of cases of respiratory ailments such as bronchitis and asthma.

ULSD enable pollution control technology for cars, trucks and buses. The cleaner diesel will be available to consumers later this year. This change will reduce air pollution from 90 percent, approximately 13 million, trucks and buses. Once the diesel is fully in use an annual reduction of 2.6 million tons of nitrogen oxides and 110,000 tons of particulate matter will result.

From EPA News Release, June 2, 2006

Water Saving Tip

According to the Environmental Protection Agency's Office of Water, weather-based irrigation controllers use local climate data to provide the right amount of water to keep landscaped beautiful. With proper programming, weather-based controllers can reduce water use by an average of 20% compared to conventional equipment, potentially saving over 11 billion gallons of water per year across the US. That is enough to fill 18,000 Olympic-size swimming pools.

Airlines Questioned on Deicing

The Environmental Protection Agency (EPA) has prepared three industry questionnaires for selected airports and airlines. The questionnaires are designed to gather information on airfield and aircraft deicing operations and chemical usage, including deicing stormwater collection and treatment systems, pollution prevention programs and management practices, information on pollutant monitoring systems, financial information and data necessary for economic impact analysis. Each airport and airline that is required to respond will

Summer Air Quality Forecasts On the Web

Free air quality forecasts and alerts are available from the Environmental Protection Agency (EPA). Ground level ozone and fine particulate air pollution are significant public health threats in New England. In order to educate the public about the air quality conditions and next day forecasts the EPA has made them available on the web. Just go to epa.gov/ne/aqi. "Air Quality Alerts" are also available to notify people when high concentrations of ground-level ozone or fine particulates are predicted.

The warmer temperatures in the summer aide in the formation of ground-level ozone. These are considered unhealthy if concentrations exceed 0.08 parts per million over an 8-hour period. Poor air quality affects everyone, but some parts of the population are more sensitive, including children and adults who are active outdoors, or people with respiratory illnesses.

When air quality levels are predicted to be unhealthy in areas in New England the air quality alert will reflect this information. Special care needs to be taken on these days to reduce the air quality, these actions include:

- Use public transportation
- Reduce driving time and trips

Continued on page 2

EnviroQuestion

How many trees would be saved if everyone in the United States recycled their Sunday newspaper from one Sunday?

Answer in the next issue.

Quarter I Question: How many tons of road salt are used each year in the United States?

Answer: 11 million tons

Air Quality Forecasts

Continued

- Turn the air conditioner to a higher setting
- Turn off electronics when not in use
- Avoid using gasoline-powered engines on unhealthy air days

Cars, trucks and buses are the primary source of air pollution that makes smog. Additionally fossil fuels burning at power plants and gas stations, print shops, lawn and garden equipment also contribute.

The Clean Air Act has led to significant improvements in air quality over the past 20 years, in 1983 there were 90 unhealthy days in New England and only 26 in 2005.

The EPA has taken a number of steps to reduce air pollution, including emission standards for cars and trucks and a cleaner burning diesel fuel requirement.

Excerpted from EPA Press Release 5/24/2006.

Gasoline

Where Does it Come From? Where Does it Go?

The United States consumes over 20 million barrels (840 million) gallons of petroleum products **each day**. Almost half of this is in the form of gasoline used in over 200 million motor vehicles that travel a combined 7 billion miles per day.

Gasoline is made from crude oil which comes from the remains of tiny aquatic plants and animals that lived hundreds of millions of years ago. The remains were covered up with sediment which became a mix of liquid hydrocarbons that we know of as crude oil.

A barrel of crude oil yields about 44 gallons of petroleum products. The products include: liquefied petroleum gas (LPG); heavy fuel oil; jet fuel; diesel fuel and heating oil; and gasoline. In 2004 refineries in the United States produced over 90 percent of the gasoline used in the United States.

The U.S. is the third largest producer of crude oil in the world. Less than 40 percent of the crude oil used by the U.S. refineries was produced in the United States. Net petroleum imports account for 58 percent of the U.S. petroleum consumption. Approximately 50 percent of petroleum products come from the Western Hemisphere.

For Your Information

Benefits of Water Efficiency

Environmental benefits:

- Reduces water use today so that water resources are maintained for future generations.
- Maintains the health of aquatic environments.
- Protects drinking water resources by decreasing the need to withdraw ground or surface water supplies for municipal or industrial demands.
- Minimizes water pollution by decreasing the amount of runoff from landscaping and irrigation practices.
- Mitigates the effects of drought.

Economic benefits:

- Can reduce water and energy bills.
- Reduces the need for developing new water supply and building new wastewater treatment facilities, which is very costly.
- Saves energy used to pump, heat and treat water.
- Provides a competitive edge for businesses as water quality regulations become stricter and the cost of water increases.

Find out more on the EPA web page.

From USEPA :
www.epa.gov/watersense/basic/benefits.htm

Published by massport

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Issue 25, Quarter II - 2006

EnviroNews

New Manifest in Use

Starting on September 5, 2006 all hazardous waste generators and treatment, storage and disposal facilities must use Environmental Protection Agency's standardized hazardous waste manifest form. The new standardized form reduces or eliminates many of the variables from the state requirements. The new manifest form also provides check boxes and adds fields that allow for better tracking of complicated shipments, such as container residues, rejected wastes, and interstate shipments.

The new form will also make it easier to collect data for hazardous waste reporting. EPA has ensured uniformity by authorizing printers and providing them with precise specifications. As with the old form, each form has a unique number for tracking and also allows multistate waste handlers to register and use their own manifest forms everywhere they do business.

Information on the standardized manifest can be found at
www.epa.gov/epaoswer/hazwaste/gener/manifest

IN THE NEWS

The Environmental Protection Agency (EPA) has ended the period of assisting newly regulated companies meet environmental regulations for boatyards and marinas.

Boatyards and marinas around New England are the first to be fined since the EPA enforcement cops have started inspections. Four boatyards in Rhode Island and one in Connecticut were hit with formal enforcement action for violating hazardous waste and stormwater control rules. New England Boatworks in Rhode Island was fined $52,300 for allowing lead to contaminate the soil and for failing to: identify hazardous waste containers; develop a stormwater pollution prevention plan; and implement a spill, prevention, control and countermeasures plan.

Taken from Environmental Compliance Alert, August 28, 2006

Construction and Demolition Debris Banned from Disposal

The Massachusetts Department of Environmental Protection (DEP) amended 310 CMR 19.017 to add certain construction and demolition (C&D) materials (asphalt, pavement, brick, concrete, metal and wood) to the list of items prohibited from disposal, transfer for disposal, or contracting for disposal. The disposal ban on these materials took effect on July 1, 2006.

In their introduction to the new regulations DEP said that increasing recycling and other diversion of C&D materials helps support development of in-state processing businesses and preserves valuable, limited disposal capacity in the Massachusetts. DEP's *Beyond 2000 Solid Waste Master Plan* (SWMP) sets a goal of reducing non-municipal solid waste by 88% in 2010. To reach this goal, the SWMP proposed to increase recycling and reuse of construction and demolition debris.

Only asphalt, pavement, brick, concrete, metal and wood are subject to this latest ban. Existing waste ban regulations cover cardboard and leaf and yard waste, which are often generated during construction and demolition projects.

As a practical matter, a 100% ban is not feasible. So asphalt pavement, brick, concrete, metal and wood should be estimated by transfer stations as a percentage of the container load by volume. An acceptable quantity for disposal is 20 (twenty) percent or less by volume of the cumulative total of the container (e.g. transfer trailer, roll-off container, packer truck). In other words, the combined total of asphalt pavement, brick, concrete, metal and wood cannot exceed 20 percent of the load's volume.

DEP's goal in banning wood from disposal is to ensure that large amounts of C&D wood and wood waste are not disposed of. Furniture such as tables, chairs, desks, etc. is not included in the waste ban.

Continued on Page 2

Waste Ban

continued from page 1

Consigli Construction Company of Milford, Massachusetts, has received the first Massachusetts WasteWise Construction Recycling Leadership Award for adopting a protocol for the diversion of C&D materials.

Instead of direct disposal of the materials, Consigli incorporates a source-separation strategy and intensive recycling into its construction business philosophy. The company's approach proves that management and diversion of C&D materials can be accomplished efficiently and cost-effectively, according to the DEP and U.S. Environmental Protection Agency, who co-sponsored the award.

One of Consigli's partners in their recycling program is Gypsum Recyclers from Holbrook they recycle drywall by separating cardboard and gypsum and selling the powder back to drywall manufacturers like US Gypsum in Charlestown, one of our neighbors at the Tobin Bridge.

For more on Consigli's efforts go to

http://greengoat.org/pdf/Milford_Fire_Station_Fact_Sheet.pdf#search=%22massachusetts%20construction%20debris%20consigli%20drywall%22

EnviroQuestion

When were plastic grocery bags first introduced?

Answer in the next issue.

Quarter II Question: How many trees would be saved if everyone in the United States recycled their Sunday newspaper from one Sunday?

Answer: 500,000 trees every week

Conley Retrofits Equipment

The Conley Container Terminal has retrofitted several pieces of equipment with Diesel Oxidation Catalysts (DOCs) with monies received from an Environmental Protection Agency Voluntary Diesel Retrofit Grant.

Working with the equipment vendors employees at Conley had DOCs put onto four of the Rubber Tire Gantry Cranes used at the Terminal, nine trackers and 2 other pieces of yard equipment. The money from EPA went towards the equipment and labor for installation.

Through these retrofits it is estimated that emissions reductions of 20 percent for particulate matter, 40 percent for carbon monoxide and 50 percent for hydrocarbons will be achieved.

For Your Information

American Attitudes on the Environment

A recent poll on the attitudes of Americans on the environment was conducted by Yale University. The poll indicates that a majority of Americans care a great deal about the environment. The following is a sample of some of the responses received.

- A majority of Americans 52% believe the environment in the United States is getting worse, only 15% believe it is getting better.
- Three of five Americans rate the country's environment as only fair to poor, only 4 percent rate it as excellent.
- The most popular remedy to America's dependence on imported oil: requiring the auto industry to make cars that get better gas mileage.
- Two-thirds of Americans say that they generally get news and information about the environment from television news programs.
- 43% of Americans say they would never buy an SUV.

For the full survey questions and more detailed results go to http://www.yale.edu/envirocenter/poll2key.prn.pdf#search=%22environment%20survey%20forestry%20yale%22.

Information excerpted from the Survey on American Attidues on the Environment-Key Findings, May 2005

Published by

massport

Environmental Management Unit
Logan Office Center
One Harborside Drive
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(617) 568-3525
Issue 26, Quarter III - 2006

EnviroNews

Compliance Tip
Review Your Waste Hauling Service

If you have managed to implement programs to reduce waste at your facility, you should also find the added benefit of reduced hauling fees. EPA advises that you review your hauling contract periodically to see if you are getting the service you need at the best price.

Tips for rebidding your hauling contract include:

- Considering whether to bid trash and recycling services together or separately
- Letting potential contractors review your operations before bidding
- Sending bid solicitations to three to five companies, including your current hauler
- Requiring a cap on yearly increases during the contract term
- Ensuring the ability to change the type and size of disposal containers, the number of pickups, and the time without penalty
- Not getting tied into a contract with automatic renewal

Adjusting hauling services to reflect the reduced volumes of waste can add up to tremendous savings through decreased hauler fees, avoided disposal costs, maximized recycling revenues, and lower equipment maintenance and costs.

Recycling Up – Trash Down

Americans are recycling more and throwing away less according to a new report released to the United States Environmental Protection Agency (EPA). The United States recycled 32 percent of waste in 2005, this was comprised of 79 million tons, including composting. This represents a 2 percent increase from 2004 and a 16 percent increase from 1990 recycling data. The EPA has collected and reported on data going back to 1960 on the generation and disposal of waste.

State Praised for Environmentally Sensitive Development

Massachusetts received an award from the Environmental Protection Agency (EPA) for its 2006 National Awards for Smart Growth. The award winners were recognized for their innovative approaches to development that strengthen community identity and protect the environment.

As communities around the country look for ways to grow that protect and enhance their natural environments and create prosperity, many are turning to smart growth strategies. They are cleaning and reusing previously developed land; providing more housing and transportation choices; preserving critical natural areas; and developing vibrant places to live, work, shop and play. In addition to creating great communities these smart growth strategies also protect the quality of the air, water and land.

The Commonwealth of Massachusetts received an award in **Overall Excellence**. The State created the Office of Commonwealth Development (OCD) to better coordinate state spending and policy decisions that influence where development happens, encourage innovative development locally, and make private investment in good projects easier.

The OCD uses financial incentives and outreach tools to ensure wise use of state tax dollars and to promote sound growth policies in the state's 351 communities. Better natural resource stewardship is a key motivation for OCD's smart growth efforts. For example OCD has taken approximately 35,000 acres of land and taken growth pressure off of natural lands and undeveloped sites.

Excerpted from EPA News Release, November 15, 2006

10 Holiday Gifts that Reduce Waste

(Thinking outside the box!)

Looking for ways to reduce waste this holiday season? Wisconsin Department of Natural Resources has compiled a list of items you can give to friends, relatives, or co-workers that generate little or no waste.

1. Tablecloth and cloth napkins
2. Lunch box/bag
3. Refillable pen/pencil set
4. Stationery made from recycled paper
5. Seeds for spring planting
6. Reusable storage containers
7. Rechargeable alkaline batteries and charger
8. Compact fluorescent lightbulbs
9. Houseplant
10. Reusable party dishes

Some waste-reducing decorating ideas for the holidays:

- Use old wrapping paper to make origami ornaments
- Use old greeting cards for gift tags
- Use old jewelry as holiday decorations
- Make edible ornaments
- Place gifts in reusable, decorative tins, baskets, and bags

Highway Diesel Meeting EPA Standards

Surveys show that about 85 percent of highway diesel meets the Ultra Low Sulfur Diesel (ULSD) standards. This exceeds the 80 percent mandate. One hundred percent must meet the new standards by 2010.

EnviroQuestion

Question: Fluorescent bulbs last longer than regular bulbs by what ratio?

Answer in the next issue.

Quarter III Question: When were plastic grocery bags first introduced?

Answer: 1977

Published by

massport

Environmental Management Unit
Logan Office Center
One Harborside Drive
East Boston, MA 02128
(617) 568-3525
Issue 27, Quarter IV - 2006

For Your Information

Don't Top Off Your Gas Tank Help Protect The Environment and Save Money

Topping off your gas tank is bad for the environment and your wallet.

Here's why:

Topping off the gas tank can result in your paying for gasoline that is fed back into the station's tanks because your gas tank is full. The nozzle automatically clicks off when your gas tank is full. In areas of ozone non-attainment, gas station pumps are equipped with vapor recovery systems that feed back gas vapors into their tanks to prevent vapors from escaping into the air and contributing to air pollution.

You need extra room in your gas tank to allow the gasoline to expand. If you top off your tank the extra gas may evaporate into your vehicle's vapor collection system. That system may become fouled and will not work properly causing your vehicle to run poorly and have high gas emissions.

Gasoline vapors are harmful to breathe. Gasoline vapors contribute to bad ozone days and are a source of toxic air pollutants such as benzene. Evaporation from the spillage of gas from overfilling can occur, contributing to the air pollution problem. Remember you pay for the gas that evaporates or is spilled on the ground.

Topping off your gas tank may ruin the station's recovery system. Adding more gas after the nozzle has shut off can cause the station's vapor recovery system to operate improperly, this system, helps to reduce air emissions.

From EPA's webpage

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Logan RSA Shellfish Agreement

COMMONWEALTH OF MASSACHUSETTS
EXECUTIVE OFFICE OF ENERGY & ENVIRONMENTAL AFFAIRS
DEPARTMENT OF ENVIRONMENTAL PROTECTION
ONE WINTER STREET, BOSTON, MA 02108 617-292-5500

DEVAL L. PATRICK
Governor

TIMOTHY P. MURRAY
Lieutenant Governor

IAN A. BOWLES
Secretary

ARLEEN O'DONNELL
Commissioner

July 3, 2007

Thomas J. Kinton, Jr.
CEO & Executive Director
Massachusetts Port Authority
One Harborside Drive, Suite 200S
East Boston, MA 02128-2909

Re: Special Condition No. 23 of Variance Order of Conditions dated May 4, 1993
Massachusetts Port Authority, Logan Airport

Dear Mr. Kinton:

I am writing to acknowledge the Massport will fulfill its obligations under Special Condition No. 23 of the Department of Environmental Protection Variance Order of Conditions dated May 4, 1993, ("Variance") through the terms of the attached *Agreement Regarding Shellfish Relocation Plan by and between the Massachusetts Port Authority and the Massachusetts Division of Marine,* dated June 29., 2007 (the "Agreement").

In addition to the shellfish relocation initially undertaken as part of this variance condition, the terms of the Agreement enable the Massachusetts Division of Marine Fisheries (the "Division") to effect shellfish measures including habitat restoration, management, clam stock enhancement, protection, and conservation activities that will preserve and promote softshell clam population in Massachusetts, which Massport will fund to the extent of four hundred fifty thousand dollars ($450,000.00).

By way of this letter, the Department of Environmental Protection confirms that payment by Massport to the Division of this amount shall fully satisfy Massport's obligations under Special Condition No. 23 of the Variance.

Thanks to Mr. Dalzell of your staff for his perseverance and attention to this matter.

Sincerely,

Arleen O'Donnell
Acting Commissioner

AGREEMENT REGARDING SHELLFISH RELOCATION PLAN

By and Between

THE MASSACHUSETTS PORT AUTHORITY

and

THE MASSACHUSETTS DIVISION OF MARINE FISHERIES

This agreement ("Agreement") is by and between the **Massachusetts Port Authority** (the "Authority"), a body politic and corporate, created by Chapter 465 of the Massachusetts Acts of 1956, as amended, having a principal place of business at One Harborside Drive, Suite 200S, East Boston, MA 02128, and the **Massachusetts Division of Marine Fisheries** ("DMF"), an agency of the Commonwealth of Massachusetts, having its principal place of business at 251 Causeway Street, Suite 400 Boston, MA 02114. Each entity above may hereinafter be individually referred to as a "Party" or collectively as the "Parties".

WHEREAS, in accordance with Federal Aviation Administration (FAA) criteria contained in Advisory Circular AC 150/5300.13 and to enhance the safety of the air-traveling public, the Authority undertook a project to improve the Runway Safety Area ("RSA") associated with Runway 22L at Boston-Logan International Airport ("BOS") (the "Project");

WHEREAS, said Project was designed to increase survivability in the event of an aircraft runway overrun, as well as to improve emergency responders' access to aircraft in the event of a crash at the water end of the runway, and to preserve, to the extent possible, the structural integrity of the aircraft in the event of such a crash, issues which had been identified as factors that impeded life-safety operations in contemporary aviation disasters at other airports;

WHEREAS, the Project required the alteration of a salt marsh and land containing shellfish, as contemplated by 310 C.M.R. 10.32 and 10.34, respectively, in a manner that required the issuance of a variance by The Massachusetts Department of Environmental Protection ("MassDEP") in accordance with 310 C.M.R. 10.36 (now 310 C.M.R. 10.05(10));

WHEREAS, the Commissioner of the MassDEP, in accordance with 310 C.M.R. 10.36 (now 310 C.M.R. 10.05(10)), permitted implementation of the Project, contingent upon the Authority's compliance with the General Conditions and Special Conditions contained in MassDEP's Variance Order of Conditions dated May 4, 1993 (the "Variance");

WHEREAS, Special Condition No. 23 of the Variance required the Authority to implement a Shellfish Relocation Plan (SRP), approved by the Massachusetts Division of Marine Fisheries (DMF), which implementation was subsequently undertaken by the Authority with the consent of DMF;

WHEREAS, during 1995 and 1996, Federal Aviation Administration ("FAA") officials and airline pilots objected to the implementation of the initial SRP because it required the seeding of clams in areas in the vicinity of BOS, which seeding FAA officials and pilots contended attracted birds to the vicinity of BOS and thereby posed a hazard to aviation safety and was inconsistent with FAA and United States Department of Agriculture (USDA) guidelines regarding wildlife hazard avoidance at airports;

WHEREAS, as a result of FAA, airline pilots', USDA and Authority concerns regarding potentially contributing to any potential hazard to aviation, implementation of the SRP was suspended in 1997 and identification of an appropriate alternative was undertaken by the Authority in consultation with DMF;

WHEREAS, DMF acknowledges that FAA and USDA policy concerning wildlife hazard avoidance at airports prohibit the Authority from contributing funds to any activity or program that, in the opinion of FAA, may increase wildlife hazards in the vicinity of BOS;

WHEREAS, after consultation with the Authority, DMF determined that its ability to assure additional net benefit to the local population of shellfish would be enhanced by requiring Massport to fund DMF mitigation measures as the final component of the SRP and by allowing DMF to directly manage and control the implementation of those mitigation measures.

NOW THEREFORE, for and in consideration of the mutual promises contained herein, the Parties agree as follows:

1. The Authority will pay to DMF four hundred and fifty thousand dollars ($450,000.00) for the purpose of funding mitigation measures as the final component of the SRP. Said payment may be made either in one lump sum of $450,000 on or before June 30, 2007, or in annual installments, payable on or before June 30 or each year, over a period of one to three years.

2. DMF has determined, and the Parties agree, that payment of four hundred fifty thousand dollars ($450,000.00) to DMF is sufficient to satisfy the Authority's obligations in connection with the SRP. DMF hereby agrees that upon execution

of this Agreement it shall inform MassDEP that in consideration of this Agreement, the Authority has fulfilled all of its obligations in connection with the SRP.

3. Alternative mitigation measures, approved by DMF, for which the payments hereunder may be used include, but are not limited to: (1) improvements to the DMF softshell clam depuration facility in Newburyport, MA; (2) conversion of the DMF lobster hatchery on Martha's Vineyard to a softshell clam seed production facility; (3) a Boston Harbor water quality monitoring program; or (4) an extension of the DMF Boston Harbor Soft Shell Clam stock enhancement program.

4. Notwithstanding anything to the contrary in this Agreement, the Authority shall have no obligation to make any payment in accordance with this Agreement unless and until MassDEP acknowledges, by letter to the Authority, that the fulfillment of the Authority's payment obligations under this Agreement will fully satisfy its obligations the terms of Special Condition No. 23 of the Variance.

5. DMF hereby covenants for itself, its successors and assigns, that no funds paid pursuant to this Agreement shall be used to fund any program, activity or the like that may be inconsistent with FAA or USDA Wildlife Hazard Avoidance Guidelines or which otherwise may adversely affect operations at BOS or any of the Authority's other aviation facilities.

6. This Agreement sets forth the entire agreement between the Parties and may be amended or modified only by a writing signed by the Parties.

WHEREFORE, duly authorized representatives of the Authority and DMF have set their hands on the dates written below.

Massachusetts Port Authority

By: Michael A. Grieco

Name: Michael A. Grieco

Title: Assistant Secretary-Treasurer

Date: 7/3/07

Massachusetts Division of Marine Fisheries

By: Daniel J McKiernan for Paul Diodati

Name: Daniel J. McKiernan

Title: Deputy Director

Date: June 29, 2007

G:\Legal\Misc\CARLEY\Environmental\DMF Clam Agreement.doc

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2006 Peak Period Pricing Monitoring Report

BOSTON-LOGAN INTERNATIONAL AIRPORT MONITORING REPORT ON SCHEDULED AND NON-SCHEDULED FLIGHT ACTIVITY

Peak Period Surcharge Regulation
740 CMR 27:00: Massachusetts Port Authority

Report Number:	**003**
Monitoring Period:	**May 2006 – October 2006**
Report Issue Date:	**June 5, 2006**

massport

Note: This report reflects the Boston-Logan Airport flight activity monitoring under 740 CMR 27.03 Peak Period Surcharge Regulation on Aircraft Operations at Boston-Logan International Airport.

Findings: This report includes projected activity data for the Summer season, from May 2006 through October 2006. Current and projected near-term flight levels at Boston Logan are well below Logan's good weather (VFR) throughput of approximately 120 flights/hour. **As a result, average VFR delays are projected to be minimal and well below the 15 minutes threshold through October 2006.**

In the event demand conditions at the airport change significantly from the current projection, Massport will issue updates to this report.

Attachments

Table 1: Summary Overview of Peak Period Surcharge Program

Table 2: Summary Overview of Forecast Methodology

Table 3: Aircraft Operations at Logan Airport Projected through October 2006

Table 4: Projected Hourly Operations, Average Weekday of August 2006

Table 5: Forecast Logan Average Weekday Operations, May 2006 through October 2006

Massport Contact:

Mr. Flavio Leo
Manager of Aviation Planning
617-568-3528
fleo@massport.com

Table 1: Summary Overview of Peak Period Surcharge Program

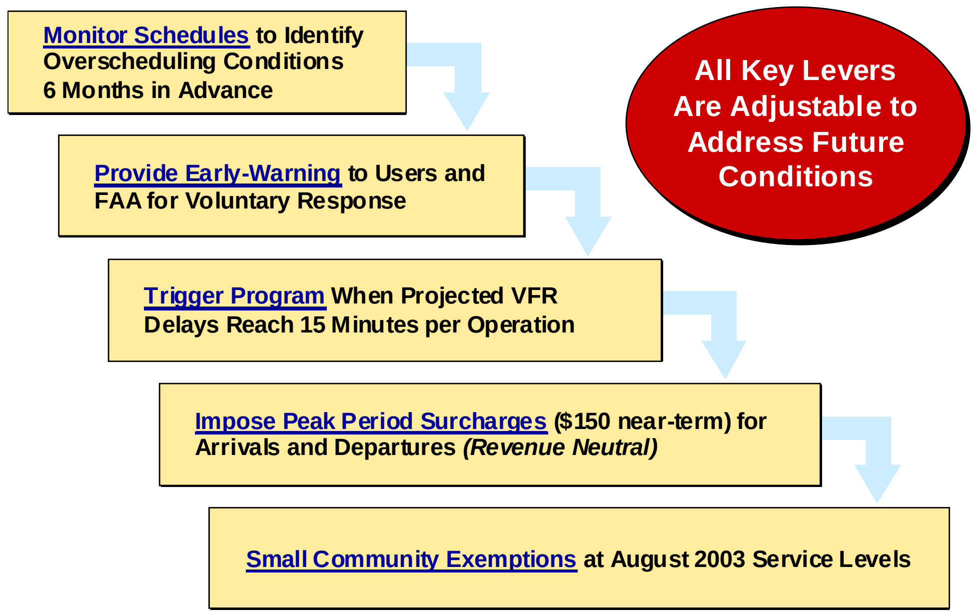


Table 2: Summary Overview of Forecast Methodology

- Scheduled passenger airline flights represent more than 85 percent of total aircraft operations. Passenger airline activity for the Fall and Winter periods were projected based on published advance airline schedules
- Forecasts of monthly activity for other segments (GA, Cargo, Charter) are based on the past three months of actual flight volume and historic patterns of monthly seasonality
- Day-of-week and time of day distributions for non-scheduled segments are based on analysis of Logan radar data
- Projections for each segment were combined to produce the forecast pattern of hourly flight activity for an average weekday, Saturday, and Sunday for the six month period from May 2006 through October 2006

Table 3: Aircraft Operations at Logan Airport, *Average Weekday Operations Projected Through October 2006*

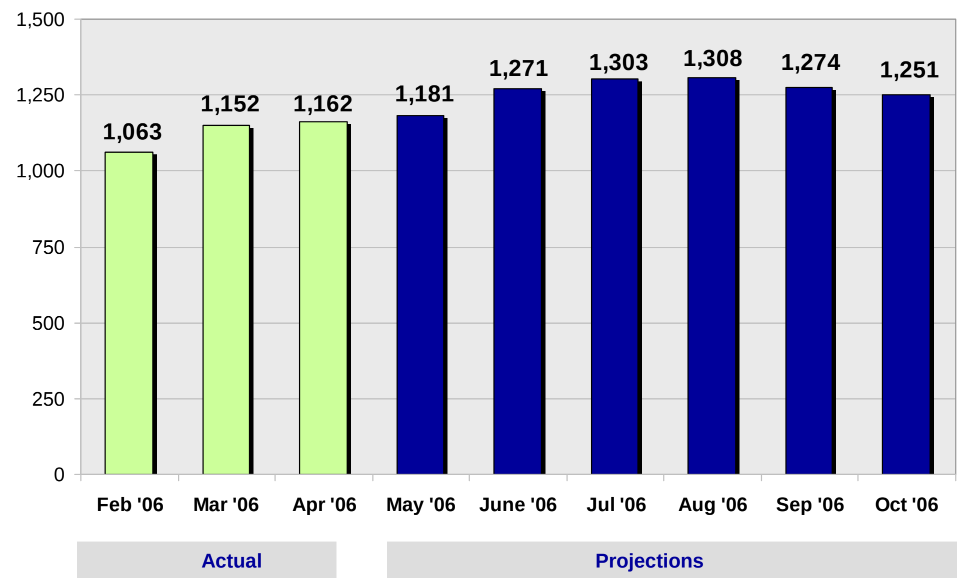
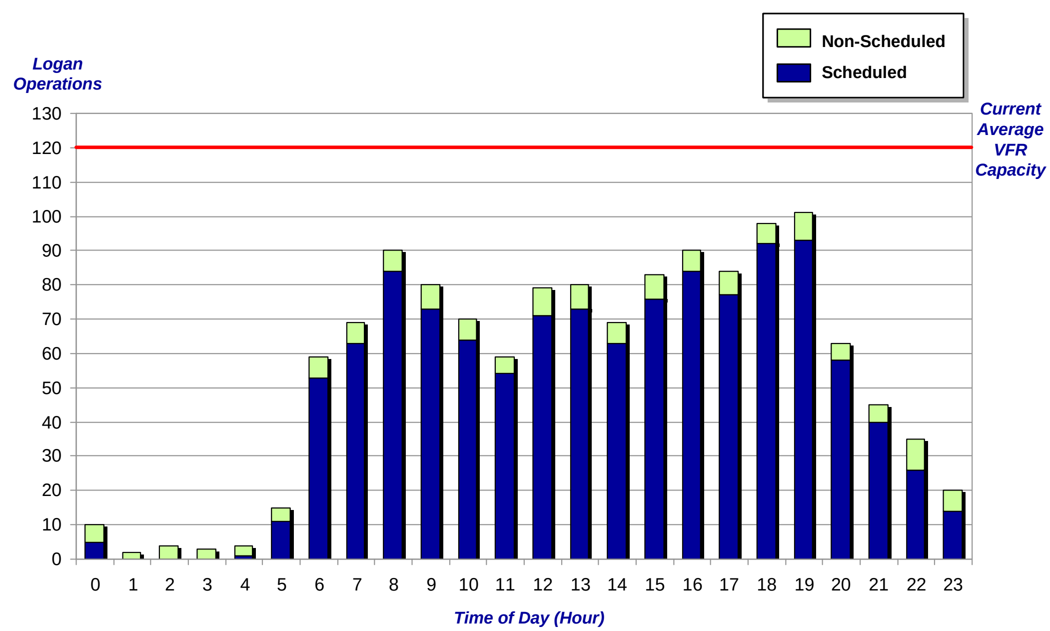


Table 4: Projected Hourly Operations, *Average Weekday, August, 2006*



Note: Includes projected services by scheduled airlines plus non-scheduled activity including general aviation, charter, and cargo operations.

Table 5: Forecast Logan Average Weekday Operations, *May 2006– Oct. 2006*

	Forecast Weekday Operations					
Hr Range	May '06	Jun '06	Jul '06	Aug '06	Sep '06	Oct '06
0	10	10	10	10	10	10
1	2	2	2	2	2	2
2	4	5	4	4	4	5
3	3	3	3	3	3	3
4	4	5	4	4	4	5
5	11	15	15	15	12	12
6	51	58	58	59	54	55
7	69	69	69	69	72	74
8	82	87	90	90	88	86
9	72	74	79	79	79	81
10	62	67	69	70	67	66
11	61	59	58	58	64	64
12	64	78	78	78	73	69
13	68	79	82	80	73	73
14	59	66	66	69	66	63
15	71	77	81	83	76	76
16	80	85	88	89	93	88
17	80	83	85	84	82	80
18	95	95	97	98	99	95
19	89	96	101	101	96	94
20	52	59	64	62	64	58
21	42	45	45	45	44	42
22	34	34	35	35	33	33
23	18	20	20	20	16	17
Total	1,181	1,271	1,303	1,308	1,274	1,251